THE FOUNDRY

A TRADE JOURNAL

DEVOTED TO THE INTERESTS OF THE WHOLE FOUNDRY BUSINESS

NOVEMBER, 1895.

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Published Monthly by THE FOUNDRY PUBLISHING CO.

DETROIT, MICH.

A FACING and Blacking to be satisfactory for all kinds and weights of castings, that can be shaken on the mold and be slicked nicely, or when mixed with water will make a good core wash, that can be used for dry sand or loam work, stand the heat and weight of molten metal whether poured hot, slow or fast, and not burn off, wash or run and will peel clean from the casting, is a Facing and Blacking that we think should interest every foundryman and molder living.

Just such a Facing and Blacking is RADIANT, and furthermore, we guarantee it to be so and will take it back and refund the price if it is not. WHAT MORE CAN WE OFFER? Radiant Facing is sold entirely on its merits and nothing else whatever has had anything to do with the extraordinary success of this Facing and Blacking. We have had some foundrymen tell us that it is undoubtedly the best general Facing and Blacking they ever used, but that they thought the price was too high. Is 2¼ cents per pound too high for the best Facing and Blacking on earth? We have noticed that these same people will buy Plumbago or Silver Lead at twice and more the price and never complain. Plumbago or Silver Lead are all right. We sell them, and would like to sell a good deal more of them; but there are objections to their use in the foundry doing general work that are overcome by the use of Radiant Facing and Blacking. How many complaints we here about the hardening of the surface of castings? There is nothing that will harden the surface of the casting sooner or or more effectually than Plumbago or Silver Lead. We grant that Plumbago or Silver Lead makes a beautiful mold and a pretty (?) bright looking casting; but the question is whether this color or a casting is more satisfactory than a dark blue steel color such as the Radiant Facing and Blacking gives it? Radiant Facing and Blacking will not harden the surface of the casting. It can be shaken on the mold, through a bag, on parts that cannot be reached with a tool to slick it, and the facing will stick and peel clean.

The whole matter is that Radiant Facing and Blacking is the very best, most economical and satisfactory Facing and Blacking for the general jobbing foundry. There is no question about this and if you have any doubts about it, send for a barrel subject to approval. Our guarantee is that it will do everything we have stated above, otherwise you need not keep it and we will pay the freight.

The J. D. Smith Foundry Supply Co.

Manufacturers of Foundry Facings, Blackings, Foundry Supplies, and Refiners of Plumbago.

Cincinnati, Ohio, U. S. A.

"The Proof of the Pudding is in the Eating." . . . . . .

The S. Obermayer Co. are pioneers in the **Foundry Facing** and **Supply** business.

The S. Obermayer Co. is the largest establishment of its kind in the world.

The S. Obermayer Co. is the largest concern in the world, importing and refining **Ceylon or East India Plumbago, Graphite or Silver Lead**—also leaders in **German, Bohemian and Mexican Graphite or Black Lead.**

The S. Obermayer Co. have the largest mill in the world manufacturing exclusively, **Sea coal** or **Bituminous Facings** of the highest grades and the finest textures, the greatest strength and the purest in carbon and, in short, the BEST on earth. We refer to our mill at Larimer, Pa.

The S. Obermayer Co. have the newest and model mill of the world for the manufacture of fine grades of FOUNDRY FACINGS and BLACKINGS, and the best proof thereof, is that among the many handsome casting exhibited at the recent WORLD'S FAIR at Chicago; especially the beautiful STOVES there, shown by American Exhibitors, fully two-thirds were made with the aid of the **S. Obermayers Co's. incomparable stove-plate facings** and their refined, pure East India Plumbago; so it was also with most of the other classes of American castings exhibited there. The best were made with Obermayer facings or blackings. Is not that a record to be proud of?

In the year 1894, **we made and sold 11,452,700 pounds fine Foundry Facings, Plumbago, &c., and sold 868,100 pounds of Foundry Supplies,** at our factories in Cincinnati, Chicago and Larimer, Pa. This more than equals the combined production of all similar factories in the United States; and we are in a fair way to double that in 1895.

Our specialties are the manufactures of only the BEST qualities of qualities of FOUNDRY FACINGS or BLACKINGS, for the HIGHEST TYPE of MACHINERY, ARCHITECTURAL, STOVE-PLATE and FINE ART CASTINGS.

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Trial samples of our Facings and other manufactures free of charge.

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CHICAGO, ILLS. LARIMER, PA.

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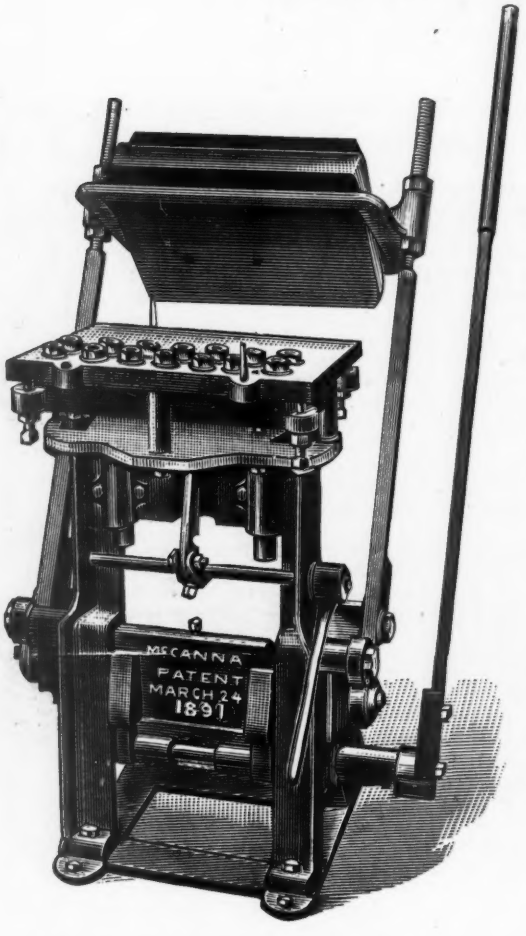
The McCanna Improved Moulding Machine

PATENTED MARCH 24, 1891.

(NEVER BEFORE ADVERTISED.)



Our Special Claims

Over other moulding machines are simplicity in construction and convenience of operation.

These Machines

Have an Automatic Reversible Rammer and Tucker (*Pean and Butt Rammer*) and are operated by one stroke of the lever.

Size of Flasks—11x15x3 in.

Weight of Machine—400 lbs.

CAPACITY of Machine, 30 flasks per hour, all gated, vented and ready to pour. The Rammer is constructed to conform with the sand, also allowing the air to escape while ramming, which equalizes the pressure. The machines are designed especially for light casting in brass, and are made interchangeable and of the best workmanship. This machine is almost invaluable where a large amount of duplicate castings are required. Any man or boy with ordinary intelligence can run it.

We supply the machine itself, also the Iron Flasks, Draw or Stripping Plates (on which the patterns are placed and can attach the patterns, either Plain or Draw Plate) also Flask Boards, etc.

We reduce the expense of moulding over hand work of 50 per cent. or more.

Price of Machine $150

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McCAMBRIDGE & CO., Philadelphia, Pa.
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C. A. BLESSING, "
J. E. LONERGAN & CO., "

This Machine can also be used on Iron Castings.

Any half pattern can be transferred to the Machine.

Send for new "Brass Foundry Catalogue" of Equipment and Supplies.

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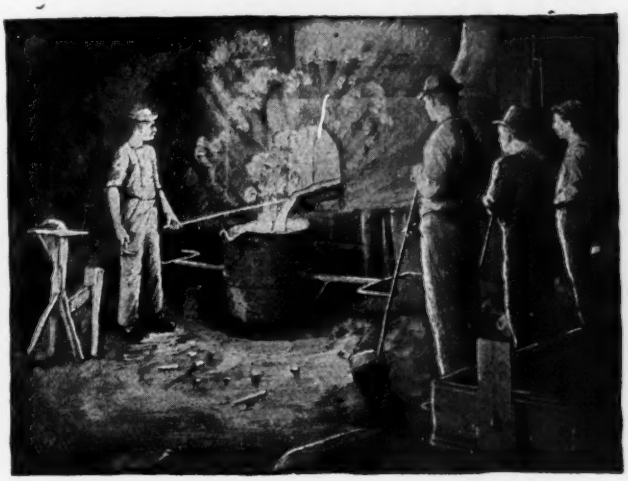

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THAT WILL TURN OUT SMOOTH AND PERFECT

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Heavy Machinery Castings
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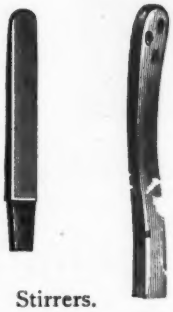
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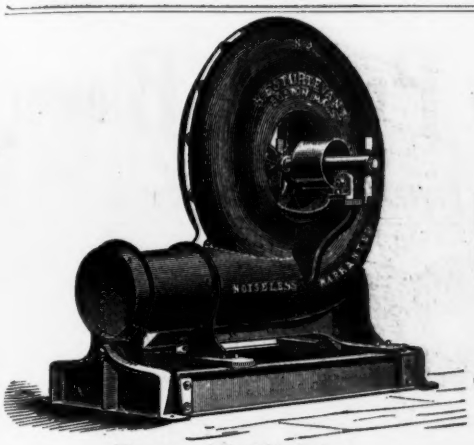

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THE STURTEVANT STEEL Pressure Blowers,

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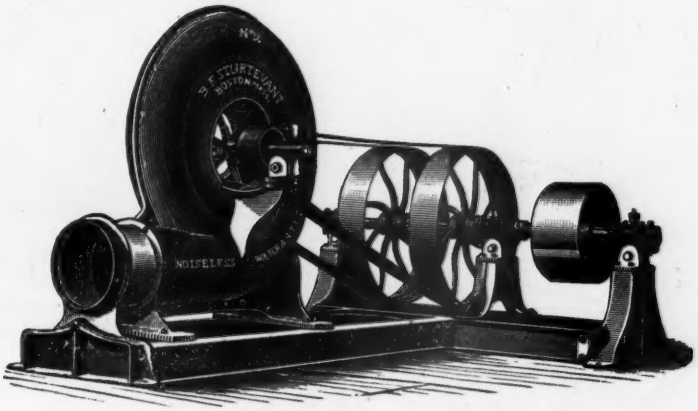
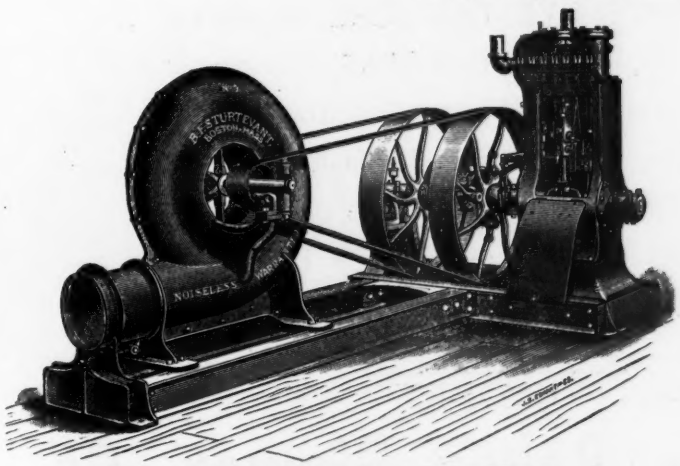


Blower on Adjustable Bed with Combined Countershaft.



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Direct Connected

Electric Motors

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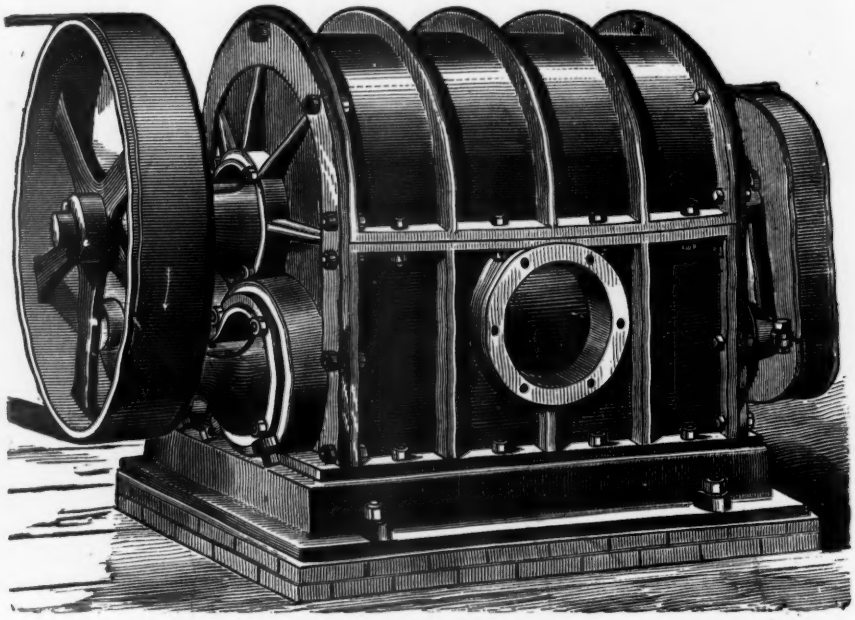
ONLY ONE BELT IS REQUIRED TO DRIVE THE LARGEST BLOWER.



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We Make a specialty of 72 Hour Foundry Coke.

ANA YSIS:

Vol. Matter,	1.13
Carbon,	88.21
Ash,	10.66
Sulphus,	.86
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These Few Lines tell the Story.

Try it. It is from a newly developed coal adjacent to the heart of the Connellsville Coke Bed. Freight rate is 16 cents per ton less than Connellsville. Shipments to all points via P. & L. E., L. S. & M. S. and N. Y. L. E. & W. Rys, and connections, only.

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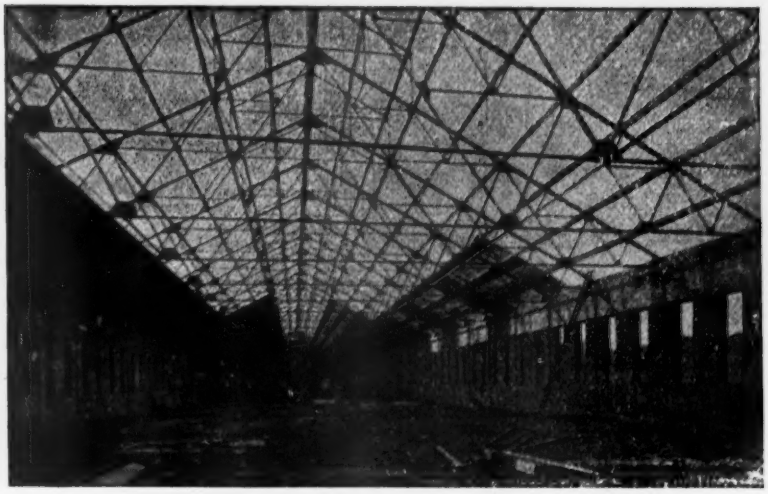
DESIGNERS AND BUILDERS IN
IRON AND STEEL
FIRE PROOF BUILDINGS

FOUNDRIES, MACHINE SHOPS
— FOR —
ETC., ETC.

Exterior of Foundry of Warder, Bushnell & Glessner Co., Springfield, Ohio.

Traveling and Jib Cranes for handling
Heavy Castings and Machinery.



Buildings Designed for Special
Requirements.

Interior Foundry Building of Warder, Bushnell & Glessner Co., Springfield, Ohio.

The roof of this building was erected by the Wrought Iron Bridge Co., Canton, Ohio, and consists of steel trusses supporting wooden purlins to which matched and dressed sheeting is nailed for slating. Trusses being 18 ft. above the floor, the wood work of roof is out of danger from fire, while the cover being of slate a suitable cornice to protect the overhanging of roof from flying sparks, or heat from the burning of neighboring buildings, renders this structure absolutely fire proof. Windows are set in the sides of ventilator throughout its entire length, so that ample light and ventilation is insured.

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THE BERLIN IRON BRIDGE CO.,

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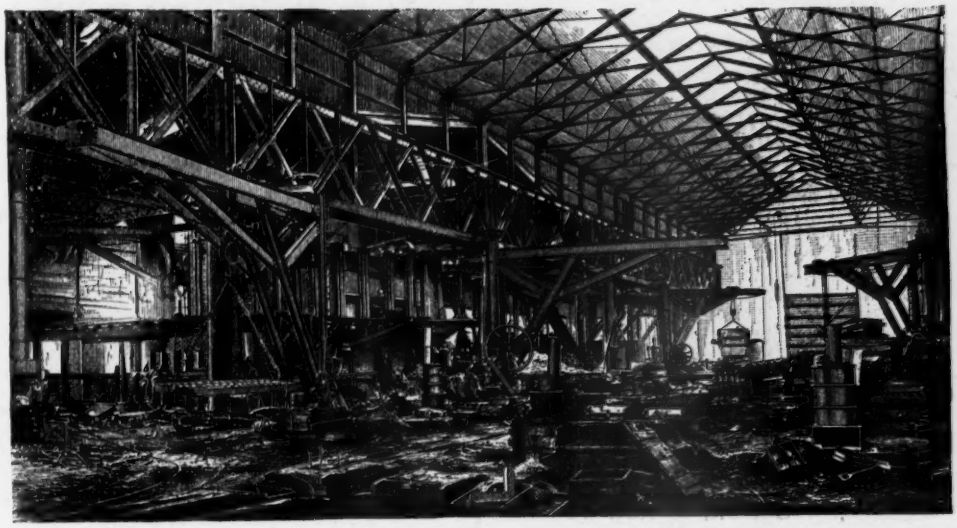
—AND BUILDERS OF—

Iron and Steel Bridges, Roofs and Buildings.



The above illustration, taken direct from a photograph, shows the interior of an Iron Foundry designed and built by us for the Farrel Foundry and Machine Co., at Ausonia, Conn. The building is 129 ft. in width by 302 ft. in length. The wings are 30 ft. and 43 ft. respectively, and the central portion is controlled by a hydraulic Crane with a travel the full length of the building and is also arranged with jib cranes for delivering material from the traveling cranes to the wing trusses.

Office and Works, - - EAST BERLIN, CONN.

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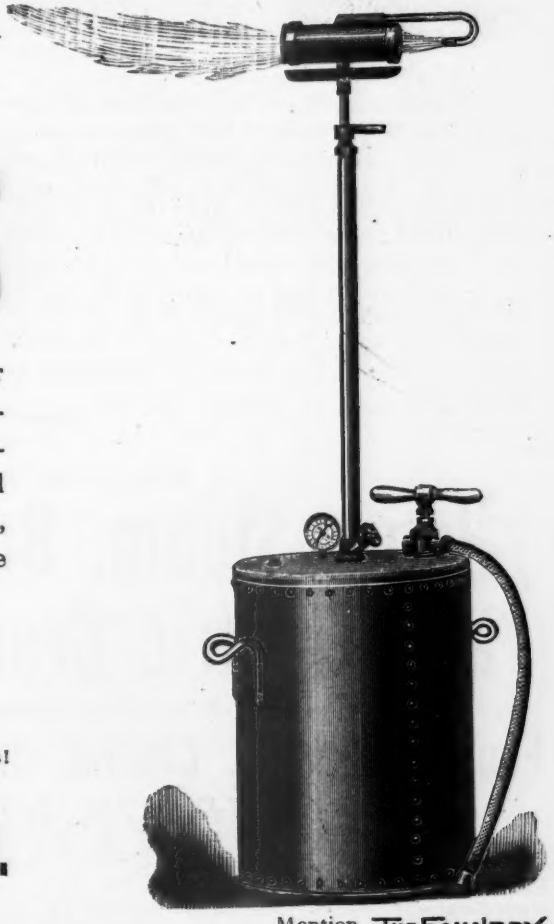
EFFICIENT!
PORTABLE!
RELIABLE!
EASILY OPERATED!
AND CHEAPER!

100 TO 4,000 CANDLE POWER,

GIVING A CLEAR, WHITE LIGHT.

Indispensible in all places where a Powerful and Portable Light is required.



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Requires No Skilled Labor!
Unaffected by Wind or Rain!
Can be Started in a Few Minutes!

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Mention THE FOUNDRY.

JOHN J. SHIPHERD, Pres. W. RUSSELL, Vice-Pres. and Mgr.
L. C. SHIPHERD, Sec'y and Treas.

THE

Phoenix Iron Works Co.

The following is a letter which was sent to us unasked for and is a sample of many genuine indorsements which we receive very frequently.

OFFICE OF
BERT. L. BALDWIN, M. E.
CINCINNATI, O.

PHOENIX IRON WORKS CO.
CLEVELAND, OHIO.

GENTLEMEN—As you may remember, you furnished a 10 ton traveling Crane which was erected at the Cummingsville Generating Station for the Cincinnati Street Ry. Co. This crane was erected for the purpose of handling the heavy parts of the Railway Generators. The easy working of this crane was appreciated by the party, who had the contract for erecting the generator, who found that where it required eight men at the hoisting chain of one of our other cranes, it only required three at your crane, with both cranes handling the same load. All of the details on this crane are well worked out and substantial, so that I expect that it will continue to give us the best satisfaction.

Yours respectfully,
(Signed) BERT L. BALDWIN.

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Hand, Steam, Belt, Hydraulic and Electric Cranes

FOR ALL PURPOSES.

Foundry Ladles, Chains, and General Machinery

WASON STREET.

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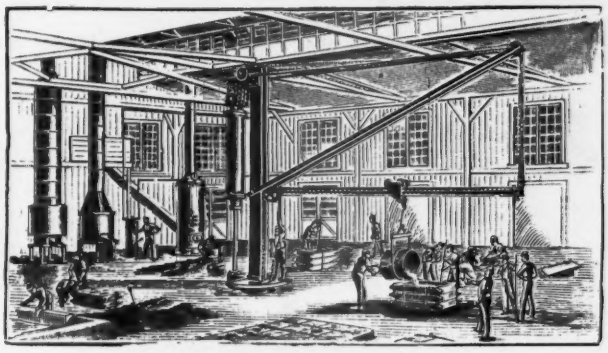
CHICAGO OFFICE, 1430 OLD COLONY BUILDING.

OH! FOUNDRYMEN, IF YOU ONLY KNEW



5-ton Ridgway Crane in a Foundry.

The Rensselaer Mfg. Co. of Troy, N. Y. have the contract for making the great 60 inch gate valves for the City of Allegheny, Pa. These valves are slungers and the castings very hard to make without losing many of them. This young concern knocked out all the old established valve makers in getting this contract because they were the only valve makers at that time equipped with Ridgway Cranes (others have gotten them since). So difficult are these castings to make, that a trade paper is making cuts to illustrate them as notable castings. We have seen what the Valve Co. wrote this paper. They were talking about the castings, not the crane. You just ought to hear them when they talk cranes! Here's what they say about the castings:—

* * * "We have made 15 of these pieces up to the present time without the loss of a single casting. We use the Ridgway Balanced Steam Hydraulic Crane in our Foundry, and **we attribute our great success to the gentleness, ease and smoothness with which these cranes handle difficult moulds of this description.**" * * *

Don't you know you can just **Paralyze** your competitors if your shop is equipped with Ridgway Cranes? If founders half realized just what this crane was in a foundry, 12 shops like ours couldn't make them fast enough. It's not advertising blow. Dozens of foundries will tell you it is so, that **the same moulders do 50 per cent. more work with the same wages with this crane than with any other.** Why, you can furnish castings at the same price as the other fellow's castings cost him and make a fair profit if you have Ridgway Cranes. Travel around and you will notice shops that have Ridgway Cranes are always full of work and making money.

Craig Ridgway & Son,

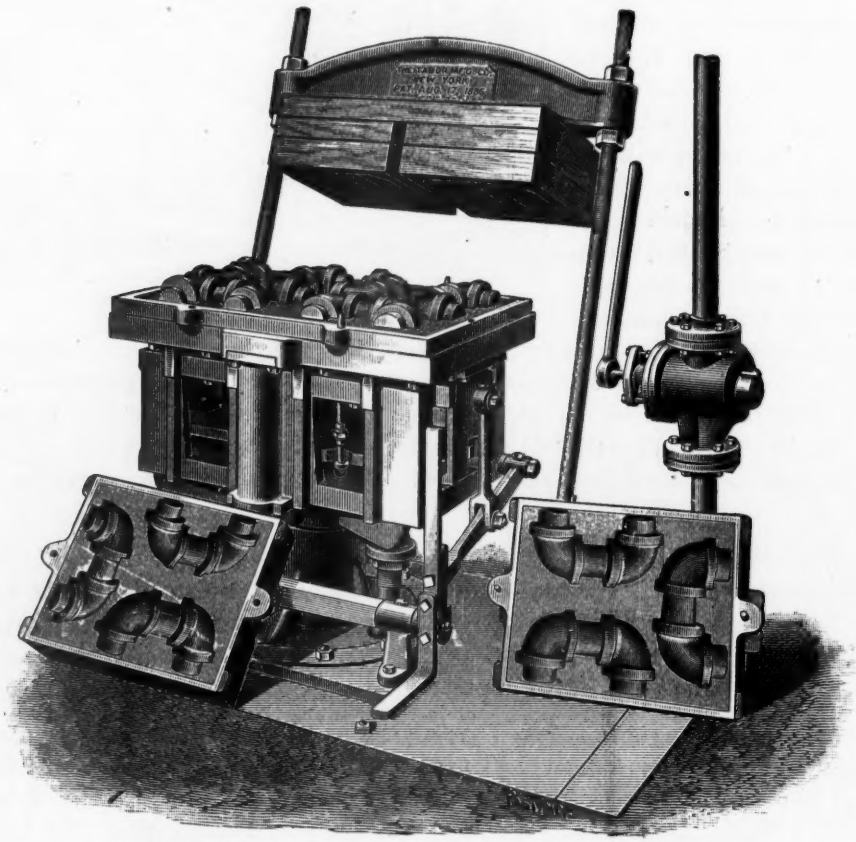
COATESVILLE, PA.

The Tabor Manufacturing Co.,

—MANUFACTURERS OF—

AUTOMATIC MOLDING MACHINES

For Sand Molds for Metal Castings.



AUTOMATIC DUPLEX MOLDING MACHINE.

Molds both parts of flask at one operation of machine, thus making two machines in one.

These machines are adapted to general castings when made in reasonable quantities.

The use of these machines is a guarantee of economy, greater quantity and better quality in castings.

Foundrymen who are interested in producing cheap castings of superior quality are invited to correspond with the Company and call at the works, Front and Franklin Streets, Elizabeth, N. J., and see the machines in operation.

39 Cortlandt Street,

NEW YORK, - - - N. Y.

? ? ? ? ? ? ?

Why Should Modern

Foundries

USE OUR

JIB & TRAVELING CRANES?

AND OUR

CENTRIFUGAL SAND MIXERS

Some of the reasons may be found in future issues of this Magazine. Descriptive circulars may be obtained from

William Sellers & Co., Incorp.

PHILADELPHIA.

The Edw. P. Allis Co.

Milwaukee, Wis. have the largest foundry (exclusively for machinery castings,) in the United States. Its interior is shown by the following cut. . . . .

The daily melt is from 60 to 90 tons. All the heavy work is done under and handled by **THREE** thirty ton

Shaw Electric Traveling Cranes,

The first of which was put in operation in 1889, the second in 1891 and the third in 1893. Besides these, there are three more Shaw Cranes in the erecting and machine shops.

These Crane are Made Only by

THE SHAW ELECTRIC CRANE CO.

MUSKEGON, MICH.

——And Sold Only by——

Manning, Maxwell & Moore,

424 TELEPHONE BUILDING, PITTSBURG.

60 S. CANAL ST., CHICAGO, ILL. **111 LIBERTY ST., NEW YORK.**

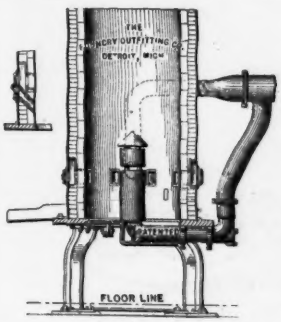
Cupola Furnaces
Blowers
Cranes
Compressors
Hoists
Elevators
Foundry and
Core Oven Cars
Ladles
Reservoirs
Tumbling Mills

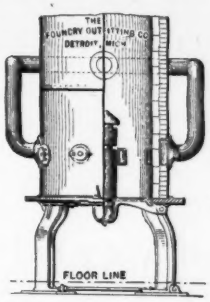
The CRANDALL IMPROVED CUPOLA

..WITH..

Johnson Patent Center Blast Tuyere.

"There are Others" and we are glad of it. They are useful for purposes of comparison.





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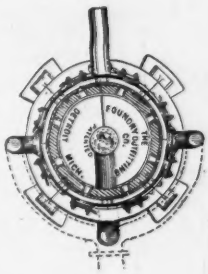

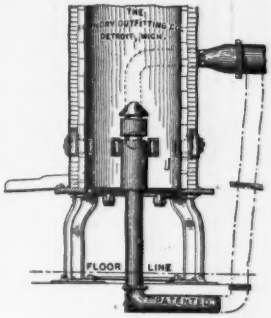

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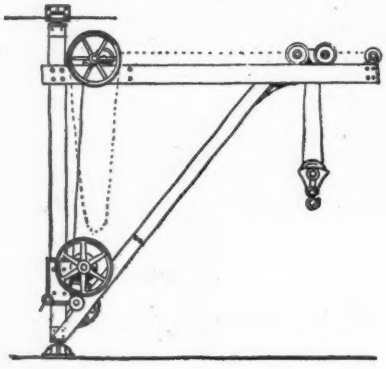

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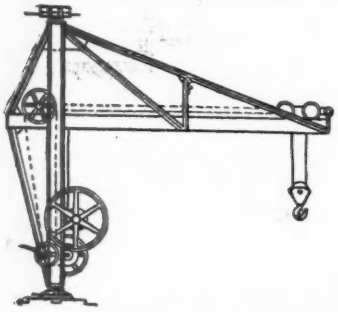

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THE FOUNDRY

VOL. 7. DETROIT, MICH., NOVEMBER, 1895. No. 39

Locomotive Cylinders.

By HERBERT M. RAMP.

There is not a casting made in regular foundry work for railroad companies that requires more skill, care and attention than locomotive cylinders. Of course, they may make some special castings that are more difficult, but they are only specialties, and the cylinders generally stand at the head of the list in a railroad foundry. No two roads use exactly the same style, unless they buy them from the locomotive works, and no two master mechanics entirely agree upon the quality of iron to be used in them or their proportions, but, however, there is a great deal in common that may be said about them that is applicable in any case. Formerly the cylinders and saddle were cast in three pieces, but to-day the plan of casting cylinder and half the saddle together is almost universally adopted, which complicates matters still further, and even compound engines are made with both cylinders cast together.

But in this article I shall endeavor to show a few illustrations and ideas that may be useful in casting the common cylinder as generally used to-day, namely: Cylinder and half-saddle combined.

The iron used is often a question of debate. One railroad will require that their cylinders be made from hard, strong iron, just soft enough to work passably. They claim it is greater economy to put more time in finishing and have a cylinder that will wear the rings out first than have a soft one that will wear easily and require reboring soon. On the other hand, another road will say, "Make our cylinders good and soft; there is so much finishing, it don't pay to make them hard, and we do not believe they wear out much quicker." Still another road will require an iron between the two, acknowledging there is something in the theory of a hard cylinder, but trying to straddle the fence

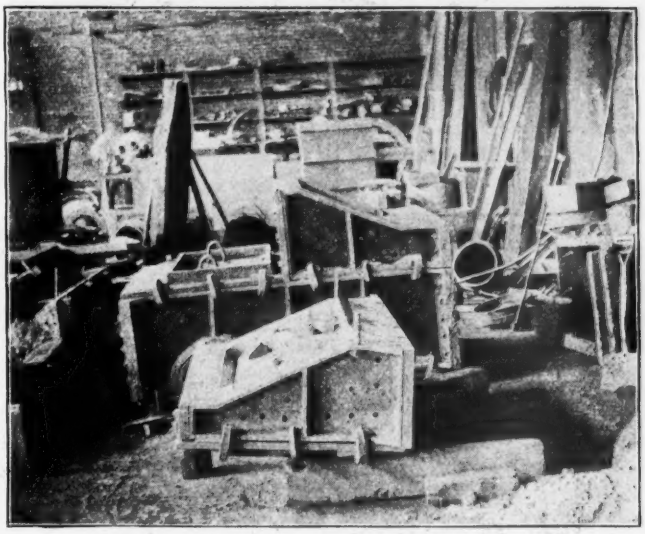


Fig 1

and secure castings easily finished. This makes the description of iron for locomotive cylinders very difficult, but the writer believes a cylinder made from good, close iron, so it can be finished smooth and true, ders will be made with sides two inches thick, and the inside partitions around the pipes seven-eighth to one inch thick. Others will make them uniform throughout except a slight favoring of the sides in

Fig. 2

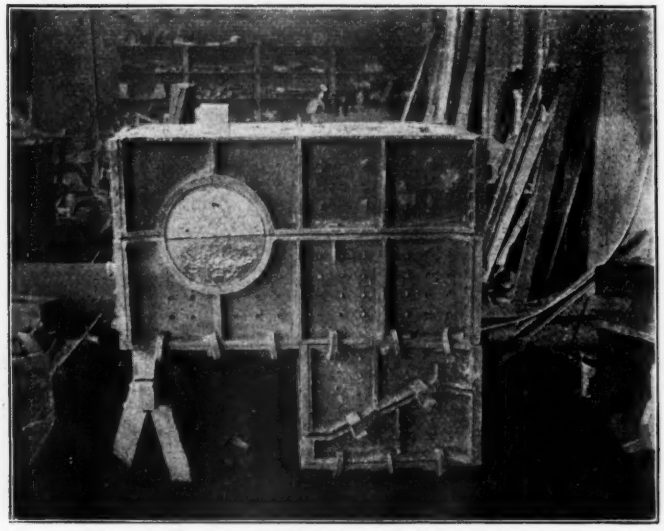


Fig. 3

is the most economical in the long run, besides being the strongest. The question of proportion is also as variable. Some cylinthickness, and other roads adopt heavy ribs in the places they break. The illustrations of the cylinder here shown is of the first-

protects the sand and prevents many a little named class, heavy sides and comparatively light partitions. It is made for the St. Louis & San Francisco Railroad Co., and of the type that throws the boiler up high; in fact, the back driving wheel axle runs under the fire box. It is twenty-inch bore and weighs 5,400 pounds in the rough. Figure 1 shows the drag and the little lower cope rammed up and that part of the mold finished. This shows one method of making the bottom flange on the saddle part of the casting, and is without doubt the nicest plan to follow, for in this case it is easy to get at the mold to black and finish. Some use cores to make the bottom flange, and others still use the pattern with loose strips which are drawn in; but this is rather a hard way to work, and the molder has almost to stand on his head to finish the bottom, while the time gained is offset by the difference in the casting. The cut shows the mold finished at that part and pattern out before the cope is rammed up, and may appear dangerous, but such is not the case. The sand is easily secured, so no danger results from ramming the cope after the drag is rolled over.

This view also shows the method of gating, which is an important item. A good cylinder must be perfectly clean, and as this point, the top of the saddle or bottom of the mold, is the farthest removed point from the bore, and has a great number of cores between, which present obstacles to the passage of dirt, thus rendering it almost impossible for any to reach the bore that enters the gate.

Figure 2 shows the drag rolled over and pattern on, and also the method of clamping bottom cope, or drag, as it may be called. Screw clamps of some description are necessary, for when it is closed before rolling over the little pockets and hanging corners would be seriously injured if clamps were driven on with wedges.

Of course it is understood, cylinders are almost invariably cast in dry sand. Some attempts have been made to cast them in green sand, but to the best of the writer's knowledge no good result has been obtained in this manner. A good dry sand mixture is essential, and without such all endeavors in this direction will meet with trouble. A mixture must be made that is free and open. Any closeness of the sand will result in buckles or scabs, and the cylinder be rendered dirty; besides, it requires more time and attention on the part of the molder where there is any danger from such causes. Often it is difficult to obtain exactly the desired quality, but the use of gravel will often render the most arbitrary sand successful.

Figure 3 shows the entire flask rammed up, and, while it may appear like an overduplication of the subject, will tend to show distinctly every step in the progress of making a casting. A close scanning of the illustration will show a number of short rods, driven in the vent holes in the side of the flask where the saddle part of the cylinder runs down. They are three-quarters of an inch in diameter and six inches long. This is quite a necessary little feature, and for this reason: The flask has no bars in the sides because it would be so difficult to shake out, and without which the straight side of sand would sag and settle when put in the oven and subjected to heat; but the wrought iron acts as prickers and holds the sand in its place and in shape. When the cylinder is ready to be shaken out, the pins can be knocked loose with a hammer and pulled out through the holes, leaving everything clear for the sand to be punched out.

Figure 4 shows the mold with pattern drawn and cope finished. No item is probably of so much importance as the blacking used and manner in which it is applied. In the first place, a blacking must be used that is absolutely fireproof. Ceylon plumbago mixed with clay is generally considered the best for this purpose. Many makers of blackings make a certain brand for this class of work, but it has been the writer's experience that even then it is profitable in most cases to add from 20 to 25 per cent ground fire-clay. The exact amount of clay necessary can be ascertained by experiment on any grade of blacking by increasing the amount of clay until the casting shows no wash on top of the cylinder, as that is where it always appears. Another thing should be carefully observed—always apply the blacking thick, say one-eighth of an inch, before slicking, and do not take it off with the trowel during that process. Aside from the fact that a finer finish can be acquired, it

buckle or scab, and facilitates greatly the labor of cleaning. A good coat of molasses water used on the surface of the mold before applying the blacking renders the surface more firm and easier to work.

and enables easy handling, but the main object of interest in this picture is the core for the bore. The road that these cylinders are made for require that the bore be perfectly true and round to facilitate boring.

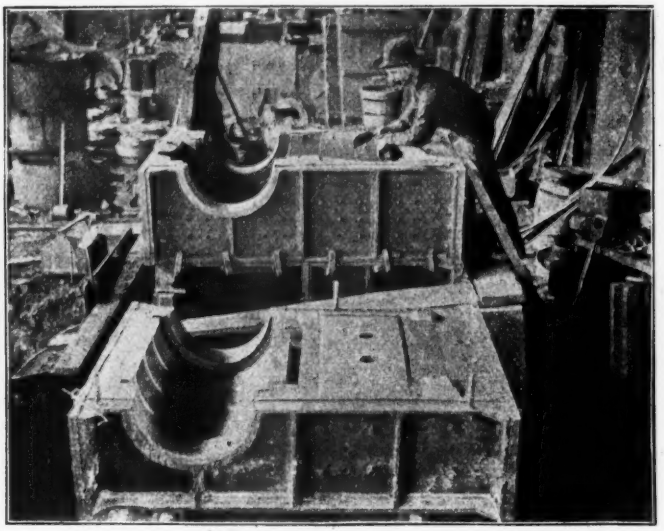


Fig. 4

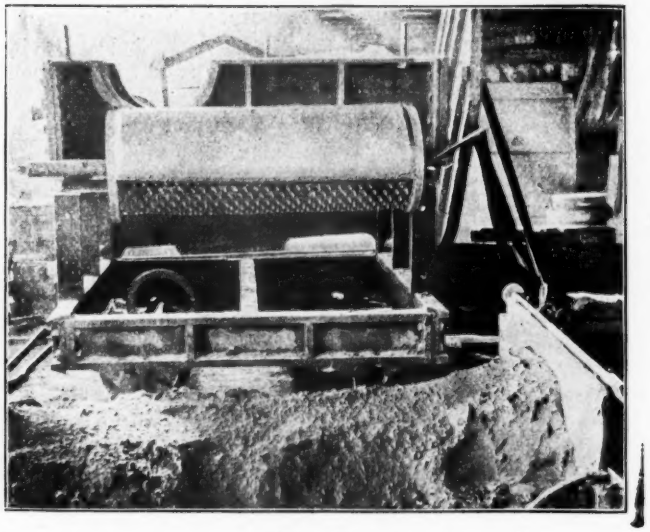


Fig. 5

Figure 5 shows part of the flask and core for the bore on the car preparatory to being pushed into the oven. The car is built on the style shown elsewhere by the writer and for this reason recourse was had to a core barrel with prickers, which makes a true core, and at the same time is a cheaper and quicker way of making it. One half

the core is made at a time, for the sand used is the same as in the mold, and does not possess sufficient tenacity to hold on all around; besides, when the heat strikes it and heats the barrel the steam will push the sand off the bottom. So for this reason one half is made and dried, and then the other follows. The barrel is cast full of holes to carry off the vent, and gives perfect satisfaction.

Figure 6 shows the cores being set, and gives some idea of how complicated they

Fig. 6

are. The one hanging on the crane is a lighting core and has to be set exactly correct to give proper thickness of metal between the steam pipes. No joints are used at the top, the cores simply come up flush, and have gas-pipe couplings bedded in them where the vent escapes. After the cope is closed on pieces of three-quarter inch gas pipe several feet long are let down through the holes in the cope shown in figure 4 and screwed into the couplings. This makes a vent hole that is positively safe and no iron can ever get into it. Another thing about vents may be mentioned here. Ordinarily, paste is used to put in the prints under the cores, but this is always attended with some uncertainty; so putty is used in its stead to a decided advantage. Mix the putty so it works free in the hands and roll it out in strings one-quarter of an inch in diameter, and place it around in the bottom of the prints. When the cores are set it squeezes the putty down and fills every crack or crevice more thoroughly than paste can, and when the iron approaches it and burns out the oil it contains it becomes as hard as a rock; it also does not set quick like paste when put on a warm mold. From a glance at the picture, and the number of cores that have to be set in such a tedious manner, it is easy to see great care must be exercised or the corners will suffer considerably by being rubbed off or broken. To assist this saturate the corners freely with linseed oil before applying the blacking, and the hardness and firmness it will give to the sand will surprise any but the initiated. The anchors used can also be seen on the joint of the flask in figure 6. They are simply square cast-iron blocks one and a quarter inches square, and made different lengths to suit the molders need.

Figure 7 shows the mold ready to pour. No pit is dug for the flask, as it is not very high, and a low scaffold is easily erected. The vent pipes, spoken of in another place, can be seen sticking far enough up through the cope, to be removed from all

possibility of getting stopped up in any manner.

Figure 8 shows the cores complete for this cylinder, finished and ready to place in the mold. The sand used in making them is similar to the dry-sand mixture, except 25 per cent more gravel is used and a little more flour. As regards blacking, they are first covered with a coat of clay wash, then blacking is applied the same as used on the mold. After drying they then receive another heavy coat of blacking, and when that is dry a light coat of clay wash. This is what gives the cores their light appearance, and it can be observed they are smooth and nicely finished.

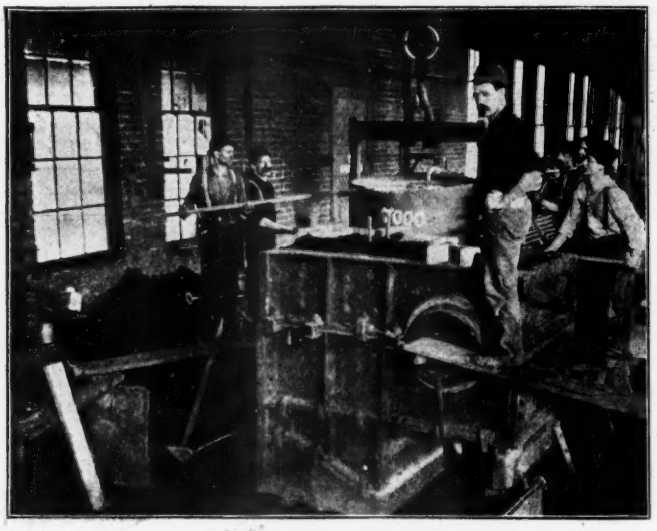


Fig. 7

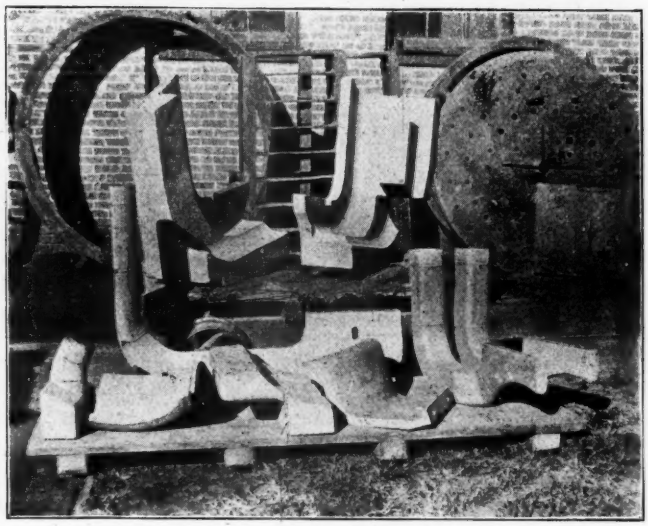


Fig. 8

Figure 9 shows the plan adopted to make the port cores. The cores are made in the iron box on the right, and dried there, which keeps them perfectly true and in shape. The old plan is to make wooden boxes and turn them out on a bed of molding sand to dry, but this is not reliable. The boxes being wood, easily get warped or twisted a little out of shape, and a sand bed is not an accurate plan by any means. The wooden frame by the side of the iron box on the left forms the top, but has a slot cut in it to facilitate ramming it up, and its use enables the core-maker to preserve a more uniform thickness than he could with a strike.

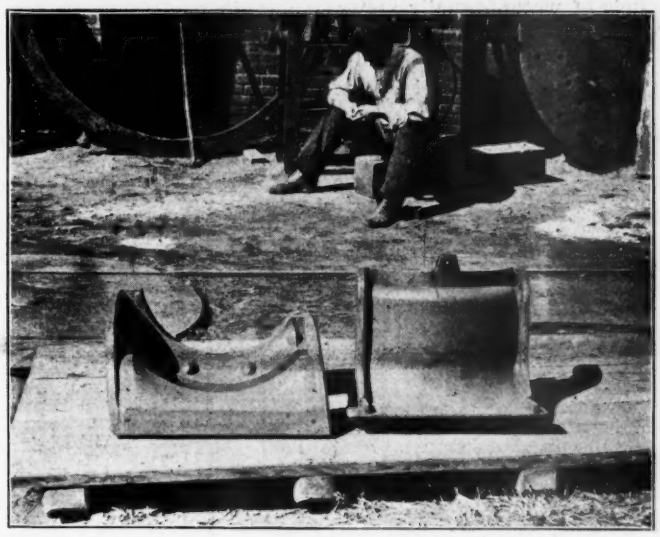


Fig. 9

It has not been the intention of the writer in any of the foregoing to show anything wonderful, or any remarkable casting or ideas connected with its molding, but rather an endeavor to show how good, acceptable castings of the ordinary grade are made, the facilities and plans adopted to make routine work. A glance at the flask, its construction and strength, will be worth the foundryman's time. Special jobs, fine workmanship and elegant equipments have their place in our business, but the truly mechanical skill is developed and shown in making work with ordinary equipments, ordinary workmen and for ordinary prices, and at the same time producing good, acceptable castings.

Fuel Oil for Foundries.

Our illustration gives a view of a foundry interior showing how the system of the Thurman Fuel Oil Burner Co. can be applied to core ovens and brass furnaces.

In the case of the core oven, the principle advantages are the ease of lighting and controlling the fire and the fact that the element guess work is entirely done away with in drying cores, there need be no half-baked or burned cores caused by the unsteadiness or unreliability of the fire.

For brass furnaces its advantages are easily apparent. So much depends upon the method and melting of brass that any foundryman can appreciate its usefulness.

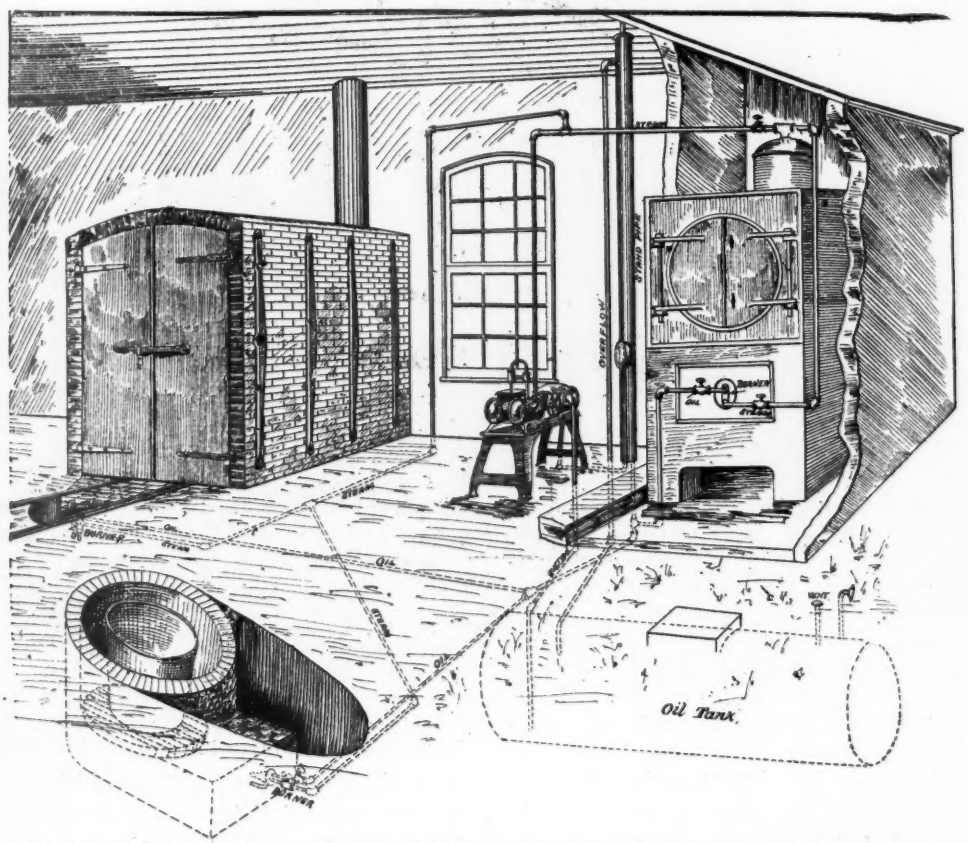
The developments of the past few years, and particularly of 1895, in connection with various departments of iron and steel manufacture, indicate the increasing use of oil as a fuel. In heating core ovens, furnaces, forges, puddling furnaces and under boilers in all classes of manufacturing establishments, crude oil has demonstrated its efficiency, economy and desirability. It has been employed with success for melting brass in crucibles, for heating bolts and rivets; and in

glass works, brick kilns, potteries, ovens, dryers, garbage crematories, and in the baking of plaster products it has been increasingly employed.

For use in core ovens it has been found that the system of the Thurman Oil Burner Company of Indianapolis, Indiana, for burning oil will utilize all the heat units contained in the oil. One pound of coal represents about 14,000 heat units, and the best results obtained have utilized from 7,000 to 9,000 units, so it will be seen that from 5,000 to 7,000 units are lost in gas that escapes through the flues. While on the other hand, one pound of oil will evaporate, under modern water tube bilers, from 16 to 18 1-2 pounds of water, while one pound of best coal under same conditions will evaporate frm 7 to 10 pounds of water—usually under horizontal boilers, about six pounds of water is the best results attainable.

Inasmuch as the use of oil as a fuel is now engaging the serious attention of many of our principal engineers, manufacturers and foundrymen, it may be to the advantage of many of our readers to give the subject some attention.

A petroleum fire can be held in perfect control by one man of ordinary intelligence, by the mere turning of a valve. He can increase or decrease the fire at will, and can maintain steam or heat at any desired point. When the fire is properly regulated to produce the heat required, it can be kept at that point with but slight attention; so slight, indeed, that one man can fire and care for a battery of from eight to ten 100-horse-power boilers, or twelve core ovens, without difficulty. By turning a valve you can instantly extinguish the fire, if occasion does not require its continuous use, and it can be again started with almost the same rapidity with a few shavings. There is not waste as with coal, when the work is done.



Interior showing Thurman Fuel Oil Burner in operation in Core Oven, Boiler, and Brass Furnace.

Two and one-half barrels of oil, each of 42 gallons, equal and slightly exceed the heating capacity of one ton of coal, and may be purchased and delivered in tank cars at any point in the United States at a very low figure. It should be remembered that oil need not be shoveled from the cars to the furnace, it needs no stoking or poking, it leaves neither cinders nor ashes to be carted away, and it makes no smoke. With an oil furnace, one man may attend to a dozen boilers without any further assistance.

The fact of being able to produce with oil a perfectly clear white fire, free from ashes, smoke, dust and soot, which can be kept under control and regulated to any degree of heat required, makes its use invaluable in electric plants, in the manufacture of glass, steel, crockery, stoneware, sewer pipe, brick, lime, and, in fact, almost any business where such a fire is required.

At the World's Columbian Exposition at Chicago, more than 25,000 h. p. of boilers were run by fuel oil piped there from Lima, Ohio. Aside from the saving in dust, noise, soot, smoke and ashes—made apparent by the white uniform of the stokers and the white boiler fronts—it would be an impossibility to bring in coal and carry away ashes for this huge plant without seriously interfering with the passenger traffic. It would require eighty cars for coal and twenty cars for ashes daily.

Air and steam are both employed to atomize the oil, but there are good reasons for giving the preference to steam. The decomposition of the water under great heat results in separation into oxygen and hydrogen—giving a highly combustible gas and the greatest support of combustion. In the case of air the non-combustible nitrogen mingled with oxygen dilutes the latter and diminishes its energy. Yet in the case of steam, the heat required to disintegrate it is a factor to be taken into consideration. Repeated experiment and observation afford the only basis of determining with exactness the relative merits of the two systems.

In expense of attendance, in the refuse produced, in the avoidance of smoke, and in cost or repairs, experience has demonstrated that many advantages are secured through the use of oil. It has been found that by the best system of burning crude oil from 100 to 110 gallons will do the work of a ton of best coal. The expense of repairs is very moderate—in most cases is scarcely an item. Another advantage is the steady maintenance of steam pressure without fluctuation. There is no necessity for opening the fire box doors, and therefore the loss of heat with the in-rush of cold air is avoided.

CAST IRON NOTES.

Devoted to Inquiries from Practical Foundrymen on the subject of Melting and using Cast Iron. Address all Inquiries to W. J. KEEP, care of The Foundry.

WHITE IRON CASTINGS WITH A SOFT SURFACE.

Several inquiries have reached me from founders who are making white iron castings for the grinding portions of corn mills. They find that the sharp ribs that are to do the grinding are soft although white, while the central portion is harder. They imagine that the sand or facing or sea coal produces this effect.

The iron will absorb nothing from the facing or from the sand. Founders making castings in iron chills often get soft chilled surfaces, which is the same thing as the soft white surface in sand molds. This occurs in both cases when the pigiron used is not of the right quality. Some charcoal pigiron will not produce a chill, and some coke iron will. It is not a question of chemical analysis. Some irons that are chilling will show the same analysis as others that are not chilling. When the chemical properties of cast iron are better understood some method of analysis may be discovered which will show the combinations of chemical elements upon which the chilling quality depends, but at present all that is known is that iron that is made from certain ores and under certain conditions will produce a chill.

The makers of car wheels and of other chilled castings find from experience which irons will chill, and purchase such irons. Such irons can be had in all the car-wheel numbers to No. 6 white iron.

Malleable iron castings are made from white iron poured into sand molds and afterwards annealed. They use white pig iron charged into a cupola, or else they use gray pig iron containing about 1.25 per cent silicon charged in an air furnace, in which silicon is burned out until it is about 0.70 per cent. This point is determined by making test

pieces which shall show a white fracture with a very slight tendency to form grey specks at the center. Iron so treated generally makes castings with a hard surface, but for malleable purposes non-chilling irons are used. To make malleable castings from a cupola a white non-chilling iron is selected, and such iron is likely to run white but soft against the sides of the mold. Those making these grinding mills should use chilling irons. For castings from half inch to one inch thick, old car wheels, with or without white pig iron, would give a cheap chilling mixture, because most old car wheels were made from good brands of chilling charcoal iron. It is yet to be seen whether some of the car wheels which are made to-day from all old wheels and other scrap will do as well for remelting. An addition to the present mixture, of some old car wheels broken as small as the pieces of pigiron that are charged, or the addition of a good white chilling pig iron, will no doubt cause the grinding edges to be hard.

TO MELT WHITE PIG IRON IN A CUPOLA.

One founder wishes to melt one ton of No. 6 white iron in a cupola. At present he can get about half of this through the cupola but the rest becomes dull and "mushy" and cannot be poured from the ladles. The trouble is that the iron is not hot enough. The malleable iron founders melt their iron so hot that it will run into the lightest castings. Experiment will show how much coke is needed to melt hot enough. If the cupola measure three feet diameter inside the brick lining, about 1,100 pounds of coke would be needed for the bed. On this could be charged about 500 pounds of iron, then 150 pounds of coke, 500 pounds of iron and so on. To melt one ton of white iron at this rate would take 1,550 of coke. The iron must be caught as fast as it melts, and must be got into the molds as quick as possible. Experiment will tell whether some of the fuel can be saved, but it is better to save the castings.

Another suggestion is to charge with the white pig iron a little very high silicon iron, like the 15 per cent ferrosilicon that has just been made at Norton furnace at Ashland, Ky. A little of this will make the iron more fluid and at the same time will leave it white. This is less likely to turn the castings gray than an addition of gray pig iron. The white iron must be a chilling iron such as is used for car wheels, and not white iron that will not chill such as the malleable iron men use.

GRAY IRON CASTINGS WITH A GRAY OUTSIDE, BUT WHITE CENTER.

Such castings are a peculiar experience to the maker of thin castings from soft gray iron.

Some have supposed that the sand or the facing had something to do with it, and when it is found that these exert no influence the pig iron is blamed or the coke is thought to contain too much sulphur.

The surfaces of the casting for a greater or less depth are perfectly gray and soft, but the center is perfectly white and hard. The relative thickness of these parts varies with the thickness of the casting. The white center may be a thin sheet 1-64th of an inch thick, sandwiched between two gray exterior surfaces, or it may increase in thickness and the gray portions become almost too thin to be seen. The white center is not chilled, because the exterior is gray and the white portion cooled last. The white center is generally a soft white iron. The file or drill can make an impression upon it, but cannot penetrate it. It is evident that the relative proportions of the chemical elements influence this state of things, but an analysis gives no hint as to what it is.

This occurs in mixtures where the silicon is over 3 per cent, and also in mixtures with much lower silicon. The white portion is of the same chemical composition as the gray outside, except that the carbon is nearly all combined in the white center.

Chemical analysis thus far has thrown no light upon the cause of this peculiar arrangement. The castings are always made from the first 200 pounds of iron that is taken from the cupola. It never comes later in the heat, and as these castings are seldom made it has been difficult to find the cause. About a year ago I gave a set of molds for test bars to a molder to pour with the first iron from the cupola, and the castings contained the white center. I found that he had taken the iron in his freshly lined ladle from another molder who had caught the first iron that was tapped in his freshly lined ladle. This iron had fallen on the fresh bottom of the cupola where it would boil; it was caught

in a molder's fresh ladle and boiled again, and was then turned into another fresh ladle and boiled a third time. Next day I had three sets of molds. The first was filled with iron treated in the same way and produced the white center. The next ladle of iron was caught in a freshly lined ladle and the second set of molds was poured with it. There was an indication of the white center in the color of the casting, but the whole was gray. The next ladle of iron was caught in the hot ladle that had just poured out his iron for the first set of molds, and he poured the third set of molds which were an even gray.

After the first 200 pounds had been tapped out, iron caught in a fresh ladle and poured into a second fresh ladle produced uniform gray castings.

The boiling on the fresh cupola bottom gave the iron a tendency to produce a white center. All castings from this iron are of a lighter color and have a greater shrinkage than iron taken out later on. The boiling in a fresh ladle of this iron that had already boiled in the cupola would almost produce the white core, and a third boiling produced it. A slight variation of the proportions of the mixture would prevent the making of the white center. Orders were given to use the first 100 pounds of iron to dry as many ladles as possible, and then to pour the iron in the pig bed, and no castings with a white center have been produced since. If there were heavy castings into which this first iron could be poured it would save its going into the pig bed.

The Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, October 16, 1895, at the Great Northern Hotel, Chicago, Ill. The president, John M. Sweeney, being in the chair. The following members were present:

J. M. Sweeney, Chicago Consolidated Iron & Steel Company Harvey, Ill.; W. N. Moore, Joliet Stove Works, Joliet, Ill.; John Pettigrew, Illinois Steel Company, Joliot, Ill.; F. M. Lyon, Burlington Route Foundry, Aurora, Ill.; L. W. Lukens, Illinois Malleable Iron Company, Chicago, Ill.; J. T. Rowland and Peter Chalmers, J. I. Case T. M. Company, Racine, Wis.; Leo Salomon and W. E. Salomon, Chicago Architectural Iron Works; William D. Klipfel and Frank J. Klipfel, G. M. Davis & Co.; D. De La Fountaine and E. W. Smith, Crane Company; O. J. Oehring, Western Electric Company; J. W. Hughes, Weir & Craig Manufacturing Company; J. A. Brady, Kurtz & Buhrer Manufacturing Company; A. M. Thompson, Link-Belt Machinery Company; S. T. Johnston, Whiting Foundry Equipment Company; E. E. Hanna and William Ferguson, Gates Iron Works; James Fyfe, Pickands, Brown & Co.; H. S. Vrooman, Garden City Sand Company; O. T. Stantial, Illinois Malleable Iron Company, and A. Sorge, Jr., all of Chicago.

Reading of the minutes of the previous meeting was dispensed with. The following applications for membership were read and the applicants unanimously elected members of the Association: Belle City Malleable Iron Company, Racine, Wis.; Belle City Manufacturing Company, Racine, Wis.; Eugene W. Smith, Crane Company, Chicago, Ill.; Joseph T. Ryerson & Son, Chicago, Ill.

The president opened the meeting with the following remarks: "Under unfinished business the association will take up the further discussion of the paper by A. Sorge, Jr., on cost accounts, which was presented at the last meeting, held in Milwaukee, the discussion of the paper having been adjourned at that time until this evening. The title is, 'An Example of Cost Sheets for Foundries.'"

A. M. Thompson: "I would like to ask Mr. Sorge to give us an example of how he would figure up the cost of castings—say 500 pounds—on which the labor of molding was $2.50."

Mr. Sorge: "I would like to answer that by simply referring to the last paragraph of the paper. 'In order to obtain the cost of any individual casting, the date when shipped is looked up, and from the daily product sheet the date of casting is determined. The molders' and coremakers' tickets for this casting are then taken from the files and the direct labor is determined from them, as well as the weight from the daily product sheet. If the casting was made from the average mixture, then the cost of the melted iron is determined from

the table giving costs of materials per pound of good castings produced. This is added to the cost of direct labor, and to the sum are added the cost per pound for indirect labor, material and expense, multiplied by the weight of the casting. The final sum gives the actual cost of the casting. It will be found that the indirect items of cost do not vary materially from one period to the next, and therefore these amounts taken from the period preceding that in which the castings were made will give very accurate results. There are three factors—labor, material and expense. But we divide these into direct and indirect labor, direct and indirect use of material, and expense per weight and expense per hour of labor."

Mr. Thompson: "Could not all these factors be massed into one factor, instead of having a great many different factors for different classes of work?"

Mr. Sorge: "There are not many different factors. There are two items that are determined accurately upon which exact cost is kept. These are the exact labor and weight of the casting produced. On these the proportion of all items is based. A number of indirect items must be proportioned one way or another. There is difficulty in so proportioning all indirect items, since they do not vary according to any one item. In some cases the indirect items of labor and expense vary according to the weight, and in other cases they vary according to the visible amount of labor. If we could proportion everything according to just one item, of course it would be simple."

J. M. Sweeney: "What proportion is made in this method of keeping costs to arrive at the cost of stock cores which are made in special pieces of work?"

Mr. Sorge: "I spoke of these in the article preceding this paper. There are two ways of getting at that. The cost of stock cores may either be determined periodically, or according to the coremaker's time employed on the special cores."

A letter was read from W. E. Wilkes, of Pittsburgh, Pa., referring to newspaper reports dealing with the use of "ferro sodium" in making castings. No one seemed to know anything of this alleged new alloy.

James A. Brady read the following paper entitled:

THE MODERN JOBBING FOUNDRY.

A large percentage of our jobbing foundries are owned and operated by manufacturers of specialties whose only excuse for embarking in a business of which they know next to nothing is that they are compelled to run a foundry in self defense, because it is impossible for them to get their castings as promptly or as well made as they can make them in their own foundry. Admitting that to be the fact, whose fault is it? Does not the manufacturer when giving his order to the foundry fix the grade of his castings made for so much per pound? The foundryman is obliged to give him work and material that will suit his figures. If the manufacturer would pay the foundryman what it actually cost him for his castings when made by himself, he would not have any reason to complain of the quality of his castings or the promptness with which his orders would be filled.

Your manufacturer is a very unreasonable person. He will bring his patterns to the foundry at all hours and insist upon the foundryman putting them in the sand at once, no matter how late the hour. A visit to his factory a few days later in many cases reveals that not one piece has been touched. The foundryman is asked to make him some special castings without being allowed the time necessary to rig up his flasks, etc., as they should be. The effort to accommodate leads to the usual result—a poor casting which is sure to be rejected.

This is a fair sample of the manufacturer who starts a foundry in self defense and undertakes to show how to run a first-class "up-to-date" foundry, and at the same time end his troubles as far as poor castings and prompt delivery are concerned. The chances are there is a basement to his factory, and that it is so dark and damp that it is only used as a storage room for old rubbish. The very place for a foundryman—of course molders do not need light and air—so he has his basement cleaned and put in shape for his modern foundry. After securing the services of a first-class foreman, wages $3 per day, and getting a cupola, fan, etc., set up, he buys some sand and iron, and now is all ready for the first heat. But on looking over his bills he finds he has invested twice as much money as he originally figured on.

He is subject to some troubles all new foundries meet with, and finds that after all it is not so easy to make good castings and turn them out as promptly as he thought he could. Some one is to blame, and he fixes on the foreman as the guilty one. He discharges him and tries another one, but with no better success. After a few days of this kind of experience another trouble stares him in the face: his business is dull, or perhaps he is overstocked with castings, yet he is using more or less castings every day and cannot shut down his foundry; he must do something. He calls upon some of his friends who are using castings to get some of their castings to make. He does not care about the price; all he wants is enough to cover the visible cost. He is running his foundry for his own accommodation, and not satisfied with that, he is anxious to accommodate his friends and the public by making their castings at cost price. But he soon tires of that business, and in a short time he is as anxious to make his foundry pay as is the regular foundryman. He has made his prices so low that it is hard work for him to ask and get a price that will pay, because at the same prices the regular foundryman will get the work every time, and why not? Does not the foundryman devote his whole time and attention to his works? It is his business and not a side issue, as it is in the case of business man will patronize the regular foundryman every time.

O. T. Stantial: "I believe we have got hold of a great many of these jobs on which prices have been made in the manner described in Mr. Brady's paper. Parties have been making them that know nothing about the cost."

Mr. Sorge: "I think Mr. Brady has made a point very well in the paper. There is another one, and that is that these manufacturers of specialties are so much more willing to accept poor castings from their own foundries than from a foundryman. In these specialty foundries many a hole is plugged up that would not be allowed at all from an outside foundry."

W. N. Moore: "What is the foundryman going to do about it? Patterns are brought to a reputable foundryman who is asked to meet the price of competitors. The buyer naturally wants the good castings at the poor price. It has fallen to my lot, and I think some others may have had the same experience. It would be interesting to learn what they do under these circumstances."

Mr. Stantial: "I agree with Mr. Sorge that a man who is making his own castings specially is not as apt to damn himself as he is to condemn an outside foundryman for giving him poor castings. He will overlook his own poor castings, but not the outside foundryman's. I have had a great deal of experience in the line that Mr. Brady suggests with patterns brought in that must be made that day and must be delivered the next morning. It puts your foundry back, puts your heat back, keeps your men and holds your teams. You sometimes have to hire outside teams and perhaps the profits on the castings is 25 cents. These castings will cost you up into dollars. It is only a matter of accommodation with you to hold that man's trade."

Mr. Thompson: "Is it not the case that those manufacturers who wish to make their own castings put up nice foundries rather than use basements? It is the foundryman who makes castings for everybody who has that kind of a foundry. When a manufacturer has enough work to run a foundry of his own, as a general rule he gets out a fine equipment."

Mr. Stantial: "I have one case in mind right here in Chicago. They are a large concern and they have very well equipped foundries with everything right up to time. For the past four or five years the head of that concern has been complaining bitterly at costs. By the way, this concern figure costs accurately. It has been a question whether they would not shut their foundry down and get their castings outside. They pour from 30 to 40 tons of iron per day the year round. They claim they can buy their castings outside, shut down and save money."

Mr. Ferguson: "There is a way of overcoming that in jobbing houses, I think. I remember an instance where I had charge of a strictly jobbing foundry. We were bothered with jobs coming in at all times. We established a rule that all jobs that must be cast that day must be in by 1 o'clock unless it was some extraordinary occasion. It worked very nicely."

Mr. Moore: "How did you compute your costs against these castings?"

Mr. Ferguson: "In the regular way at the regular rates."

L. W. Lukens: "When you made the rule for 1 o'clock were there any other foundries close to you?"

Mr. Ferguson: "There were other foundries in the same town."

John Pettigrew: "I think it is a very good way to charge for work that comes in and must be done at once, by the pound for the casting and the molder's time. The majority of the work is hard to get along with. There is excitement all around, and the probability is that the casting is spoiled. Who must lose the price of the casting, the foundryman or the buyer that comes in in a hurry? I think it is the buyer that ought to lose it."

Mr. Sorge: "There is another element, and that relates to the patterns furnished. They are generally made in a hurry and are all out of shape."

Mr. Hanna: "I have had several years' experience in jobbing foundries, but it is the same with that as with everything else; it simmers right down to the question of personal judgment about what a man should charge for any piece of work. We simply charge for the molder's time and the usual rate for casting besides. I don't know that I ever charged for the time the molder put on when he lost a casting. I don't remember that I ever could, because if the casting is lost that night you have all the next day to mold it again."

Mr. Hanna: "The question has been asked if it were wise to take a piece of work at the price that it had been done for by some one else or let it alone. It is simply a question of knowing what your work costs you. A shop doing jobbing work should know what different classes of work cost. I see no reason why a person running a jobbing shop should not be able to judge by his past experience very accurately what a job should cost. Then the question of taking it or letting it alone is simply a matter of backbone."

Mr. Moore: "If the foundryman has also a machine shop he charges in the machine shop so much an hour and so much for material. Now, in the foundry I believe, in the majority of cases, the work is sold by the pound. Why does he not do the work in the machine shop by the pound?"

Mr. Sorge: "The explanation of that matter is, that usually in the foundry the labor cost is included in the pound cost of the casting. Instead of saying a piece of work has cost so much, we say it has cost so much a pound to make it. There are machine shops that finish machines by the pound, and boiler shops that make their boilers by the pound. It is done not only in foundries, but in every department of work."

Here is a Chance.

One of our friends who sends us in yearly a great many subscribers from the city in which he resides, suggests that it might be a good plan to offer something in the way of an award to that molder who sends us the greatest number in a given time. Acting on that suggestion, therefore, we desire to make the following proposition:

To the one sending in to this office prior to April 1st, 1896, the largest number of subscribers we will give a handsome molder's tool box with lock and key, together with a set of molder's tools, to the value of $25.00, list price.

To the one sending in the second largest club we will send tools to the value of $15.00, and to the one sending the third largest we will forward tools to the value of $5.00, and to the fourth largers list one volume of either West's or Bolland's works on iron founding.

The tools given to be the well-known brand manufactured at Burr's Damascus Tool Works, Detroit, Mich., and the winners of the prizes to select such tools as they desire from their illustrated catalogue. The names of the prize winners to be published in our April issue. All parties competing must announce the fact when sending in clubs.

An Old One.

It is said that at Fallston, Pa., there still stands a cupola over one hundred years old made of stone lined with brick and bound around with iron bands. It is in the works of S. H. Darragh and is still in constant use.

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

THE FOUNDRY

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JOHN A. PENTON,

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THE FOUNDRY is issued promptly on the 20th. of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

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Trade Outlook.

Perhaps in a few lines it may be a trifle better, such as car work, marine engines, locomotives, etc., but they are the exceptions. The stove foundries and agricultural shops continue to hold their own, and in the case of the former they evidently see plenty of business ahead in the shape of good business in 1896. While the stove men are themselves surprised at the demand, which shows no signs of abatement, though ordinarily at this season of the year the winter trade is fully stocked up. Orders have, however, been held back this season as never before until the last minute, and are being rushed forward when the goods should be in retailers' hands.

The orders for railroad rolling stock that are being placed are giving many car shops plenty to do, and in this connection it may be as well to note that even in the face of the great demand for cars that the roads are not placing anything like the orders they should, and these must certainly come later.

Machinery shops report a falling off in several lines; it is a sort of "between seasons" in everything from cotton machinery to machine tools or stationary engines, but for all that many of them are quite busy and have a winter's work ahead. Pig iron has weakened some in certain lines, owing to the over-anxiety of a few furnaces, but there is no overproduction and no likelihood of it, and it is expected that the first weeks of the new year will see so many buyers in the field as to perhaps stiffen prices again or prevent a further cut for some time. Molders' wages, another important item in some places, continue to advance a trifle, and employers as a general thing are meeting their men half way, and disturbances are being very generally avoided.

The Scrap Heap.

At last the many-sided question of wages, strikes and labor organizations has reached the Foundrymen's Associations in good earnest, via Philadelphia.

* * *

It is well that it has. THE FOUNDRY predicts that in the long run, if properly managed, much good will result, and if not

properly discussed and considered, the association or associations had better have left it alone.

* * *

By properly is meant something after the manner adopted by the stove manufacturers, as repeatedly pointed out in these columns.

* * *

If such an agreement had been in existence between associations representing respectively the employers and employees at the foundry of S. L. Moore & Son's Co., in Elizabeth, the trouble existing there and described in the report of the proceedings of the last meeting of the Philadelphia Association, would have been impossible.

* * *

The day for strikes is going by. This country is getting sick of them, but the Frick-Carnegie-Pullman method of settling them does not settle.

* * *

What is needed is prevention, hence our pride at seeing the example set by the stove foundrymen to the entire country and all its industries.

* * *

Their system has been subject to every conceivable description of strain in prosperous seasons and hard times, and has been found sufficiently elastic to meet every emergency satisfactorily to all.

* * *

During the recent panic there were no wholesale reductions in wages, and during the good business of the past few months there have been no increases in wages, and an industry that a few years ago lived in a state of perpetual warfare, is enjoying perfect peace.

* * *

If the Philadelphia Foundrymen, or any other set of foundrymen, wish to see this system extended, let them send for Henry Cribben, of Cribben & Sexton, Chicago, one of the best known, most popular and successful foundrymen on earth to-day, and they can hear the experiences of a man who has had more to do with such matters than any one in his line alive, and secure some information concerning the nineteenth century method of putting down strikes by not having them.

* * *

If these associations were to put into execution such a plan, properly administered, it would of itself be an ample return for the entire labor and expense of their existence, to say nothing of anything else.

Krank's Korner.

The bonus is distinctly American. In no other place than the land of the Stars and Stripes do towns and cities to such an extent offer inducements to make up for deficient natural advantages. Every concern is probably the recipient of several epistles monthly from towns desiring to become manufacturing centers, offering a bonus, generally in the free donation of ground; often a willingness is expressed to erect suitable buildings, and once in a while a promise of the city to furnish some cash also; an exemption from taxation for a term of years comes along with a description of the town, its churches and high school, railroad facilities and its abundance of pure water and air, cheap labor, etc.

* * *

The offering of inducements of this kind to increase a town's population are at present very popular, and while we do not doubt the wisdom of the city council in pursuing this course, yet we desire to present the other side to the story. Not long ago bounties were offered to stimulate patriotism, it developed the bounty jumper. At present a new species of the jumper, the bonus ghoul, has appeared, and as a rule he has got everything to gain and nothing to loose. With drawings and specifications of his intended plant, the great number of men he will employ, he dazzles the inhabitants of the town of Sidetrack into voting him their confidence and some of Uncle Sam's eagles, and while the town may think itself secure, it is well to bear in mind that when you are dealing with a sharper the odds are against you, for it is hard to beat a man at his own game.

* * *

It is the ambition of every little village to

acquire some of the bright industries that have made large cities out of small towns. After it secures a few churches to dispense salvation, after it has a few sample rooms to counteract this, it begins to consider a foundry as the next desirable thing to realize, even if the community can only consume a dozen plow points and three fire backs per quarter. Now we don't blame a town for exerting itself to secure all the comforts of home, but we do think it unwise to ask industries of this kind to locate in places, where there is absolutely nothing to support them eleven months in the year.

* * *

And how about the foundry that accepts inducements of this kind; how does the concern succeed that takes a few carloads of second-hand brick thrown into the form of a factory under a low-priced contract as a promise for a bright future

The value of a good location can hardly be estimated in dollars and cents. Advantages are too often summed up to be worth so much, but when you are away from them, when you have ostracized yourself from the realm of commerce, when you have placed yourself outside of the big arteries of trade: when you find no home market for your products and find yourself unable to compete for outside work on account of such things as high freight rates, excessive cost of materials, etc., then you will begin to realize that you very much underestimated natural advantages, and you will find out how soon even a large bonus is eaten up in trying to produce them.

* * *

This bonus offering produces dissatisfaction all around. The towns offering same expect too great a return for their investment, generally double of the actual. The industry man moving there also expects to have the best of the bargain, and when their expectations are not realized, they, too, grumble; in fact, the only thing liberally reciprocated between the bonus giver and the bonus taker is dissatisfaction.

* * *

In this connection we wish to sum up the situation in a short way with the aid of a few donts:

Don't think that cheap labor is always cheap and desirable.

Don't value a building lot too high in a new locality.

Don't underestimate natural advantages.

Don't overestimate artificial creations or their efficiency.

Don't give low taxes, low rent, low wages or anything else that is low, too much weight, because it is low against commercial integrity.

Pokey's Pointers

III.

Widbur is the name of Pokeys latest acquisition for a superintendent. He is received reservedly, like all men without a reputation, who must vindicate and prove their ability before those under them will regard them as superiors. Everybody treats him politely, as long as he is looking them squarely in the face, but as soon as his back is turned the men begin to converse in the language of the deaf and dumb, and when he is out of hearing he is criticised to the full extent. Not only are his actions dissected, but the language used in demonstrating his incapacity would make fine material for anyone wishing to start a sulphur bath. The fact of the matter is that Mr. Widbur is not incapable at all. He is very able and very original; he has spent more of his time in school than he has in the shop; he knows more of mathematics than he does of human nature.

Mr. Widbur never intends to offend a man, although he does so unconsciously, but he does believe that if he can show a man a method whereby he is enabled to increase his output without increasing his physical exertions that this man should be perfectly willing to agree to this, and here is where the men kick. They are opposed to turning out more work no matter if a jig is provided them that lessens their labor one half; this is human nature all the way through.

Pat Egan and Tom Bowers have been running Pokeys shop for years, and new ideas have meanwhile been born. They could transplant a new idea into their men better than Widbur, because they know how to go at a man without getting him on his ear. They know one of the secrets of handling

men, to administer orders so that they are to all appearances nothing but pure advice. They handle orders like a mother does Castoria, and the men holler for more. Widbur's orders are swallowed because they must be, but since they are not handed out with a brotherly touch, they are awkward to hold down and are not responded to as quickly.

We cannot help but think what a pleasant compound it would be if the fine scholarship of Widbur and the equally elegant experience and knowledge of humanity possessed by Egan and Bowers could be mixed together in a sort of 'alf and 'alf.

Widbur has not so far carried his reforms into close proximity to Tom Bowers and the foundry. This is because his experience with that part of the establishment has not been conducive to further progress and taught him the value of going slow in that direction. One of his first official acts was to call Tom over to the machine shop to look at a cylinder, where the core was supposed to have been set out of center; it appeared so, for there was not stock enough to permit of a clean finish on one side of it, according to the dimensions on the drawing. Tom came over, adjusted his spectacles, looked her over and acknowledged that it did look as if something was wrong, but Tom is long eared, and experience has taught him that things are not always what they seem, as the astronomer remarked when he found that he had been looking at a cat perched on the lens of his telescope instead of at the moon; so Tom borrows a rule—he never had a tool of his own—and begins to measure the distance from outside of flange to the bore of the cylinder. When he had been handling the rule a dozen times over, Tom could see his mouth begin to extend towards his ears in a broad Pennsylvania Dutch grin. Mr. Widbur says, "Tom, look here. From here to here is just three and an eight and a sixteenth; just opposite this, right in line with the place that won't true up, it is three and three-quarter, scant a sixteenth; now up here and down here, she is just three and a half, a thirty-second short. I thought it was funny how that core could get out; always look at home for your trouble first, Mr. Widbur. I can't come in here and center the castings properly for you. I can't stop to monkey with you people, because you don't know your business. When you send for me again be sure the core is out of center and not your darned old machine."

The next day Widbur came out in the foundry with the pattern for a bushing, and explained to Tom that he would like to have the hole through the center made a little larger.

"All right," says Tom, "I will take out the green sand core the pattern leaves and put in a dry sand core of a larger diameter."

"I don't think you need to go to that much trouble about it," remarked Widbur; "just rap the pattern good, that will be sufficient."

"It will, will it," says Tom, "that may be the way you fellers make a hole larger down in Maine, but in this country, when we rap a pattern it leaves the mould larger and makes the cores smaller."

"Oh, I see; I have got the thing wrong end to. Make it to suit yourself Tom."

It is curious how such small things will discourage the interchange of ideas between men in positions like Widbur and Bowers occupied. Both of them knew a good bit that they might with profit have exchanged between them. We don't know exactly what Widbur thought of Tom, but we know the latter remarked to confidential friends that that blooming graduate knew nothing except college theories, and here is where Tom was wrong: first, because Widbur did know something else; second, because he disparaged college education. It is not a sin to get an education, be it college or university. There are so many branches of knowledge that seem not to be of any benefit to us at all in our calling, and yet those that have got an insight into other things get along surprisingly well in their own.

A good education is the greatest assistance anyone can have, is a necessity to success, but it becomes sometimes a hindrance when it is not applied right. An education can be handled wrong, and there are other things that should go hand in hand in hand with it to make it useful. Butter alone is not a pleasant food, but taken along with something else its utility is apparent, and just so with an education. No one can have too much of it, if it is only mixed in proper proportion with judgment, reason and a

careful study of human nature according to its surroundings.

As for Pokey he feels satisfied with an increased dignity; he continues to take an interest in the foundry as long as he can do so without opening his purse. The other day he ran across Tom out in the yard trying to grade some scrap.

"What are you looking for," says Pokey.

"I don't know," was Tom's reply, as he yanked away at a wrought iron rod, whose terminus was an unknown distance below.

"Cheap iron, Tom," said Pokey.

"Yes."

"What is the matter with you; you look out of humor; anything go wrong?"

"No."

"This is fine iron anyhow, and cheap, too. I am glad we gobbled it up before they got hold of it down at the Enterprise. We can squeeze them a little on future contracts, Tom; a couple of dollars on the ton. It amounts to something. What are you making all those piles of it for?"

"Sorting it over, sir; grading it."

"And what is that for?" said Pokey, who wanted to draw Tom out and get him to talk.

"What is it for? So that we may know what we have got."

"Well, it is iron, ain't it?"

"Yes, some of it is."

"Ain't all of it?"

"No; some of it is steel."

"Well, it can all be melted up, can't it?"

"Yes, it can all be melted."

"What is the use of sorting it then?"

"I ain't doing this for fun, Pokey. If I let this thing be shoveled into the cupola as it is, you would hear from your customers before long."

"I would?"

"You are darned right you would, and it wouldn't be any social call they would make you either. What did you pay for this?"

"Eight dollars, all the way through, on this last lot from Levy, the junk man."

"What does a low grade pig cost?"

"Eleven and a half, laid down here."

"Mr. Pokey, I wan't to tell you something. I hate to shake your confidence in yourself, but I believe you are sometimes mistaken."

"Another pointer coming?"

"You may call it what you please, and take it as you think best, but I believe in your anxiety to get the best end of a bargain you have fooled yourself in this scrap buying business."

"How could I fool myself? Iron at eight and iron at eleven-fifty; how could I make a mistake there? Tom, have you been imbibing lately?"

"You will loose your joke cracking disposition soon enough, Mr. Pokey. Here you have bought a hundred tons of scrap at eight. Now maybe you think you have got a profit of three and a half per ton coming to you from that transaction."

"Most assuredly I do."

"Hold on a minute. Don't be too much in a hurry to reach conclusions, if life is short. When you buy pig you know somewhat near what you are getting."

"Same way with scrap," said Pokey.

"Not much. You don't know what you have got. When you buy scrap you get net weight, or twenty hundred to the ton; with pig you get gross weight, or twenty-two forty."

"Well I will be blowed if I didn't forget that; but that won't make up the difference in price."

"Here is a pile I can't use at all."

"How is that?"

"Because we have got nothing to pour it into. All our customers want soft iron. If we were making stamp shoes or sash weights I might use up a little of that malleable wrought iron and steel now and then, but as it is I can do nothing with it. Then this pile here, consisting of burnt out grate bars, etc., will not yield suitable iron unless a high silicon pig is used with it, and this comes high, don't it?"

"Yes," said Pokey.

"Now," said Tom, "when you count up the difference in weight, the loss of iron that can't be used at all, the cost of sorting the small stuff and breaking the large pieces, about how much do you think you are ahead by buying scrap?"

"I don't know; but I am going to make Levy take back what we can't use."

"Yes you are; Levy knows better. He is a finer judge of iron than you think. If it was a piece of brass he would jump at it quick enough, but not old steel scrap; it is worth next to nothing, and Levy knows it, too."

"Well, if I buy scrap after this I will buy it cheap enough."

"You have got to do it to come out even; it costs so much more to handle, and with the best of care it may cause a variation in your iron. Then again agricultural machinery scrap is especially undesirable, because malleable iron is now used so extensively in its manufacture, and you hardly know which is which till you put a sledge on it."

"I will make somebody pay for this."

"Say," said Tom, as Pokey started to go away; "I would like to have thirty or forty feet of hose for the foundry; handy around the cupola, and for the night men to wet down sand."

"You burned up the last one."

"It was about time; it had lasted two years and leaked all over."

"I am inclined to think that a hose in the foundry is a luxury. Tom, I don't own a national bank."

"What did you put that fire escape on your pattern shop for? Only a couple of men working up there."

"To give a little dignity to the front of the building."

"Well, Mr. Pokey, I have no objection to that; but I wish you would be as anxious to give us a little dignity inside as you are out. We would think so much more of it. What are those barrels up on the roof for?"

"Because the insurance companies ordered them put there."

"Do you know that it takes three men a couple of hours twice a week to keep them full?"

"And what of that?"

"At ten cents an hour, that amounts to a dollar and twenty cents a week, or sixty-two dollars and forty cents a year; and what good is a few barrels of water in case of a fire anyhow? Don't you think the insurance companies would be perfectly willing for you to substitute a hose properly connected. Don't you think the money you now spend for carrying water up on the roof would buy a pretty piece of hose and be far more useful thus than the way it is spent now?"

"I will think about it. That is another pointer, Tom. You always do have a way of killing a cat without cutting his tail off."

Deaths.

S. B. Pierce, who has been a foundryman in La Crosse, Wis., for 40 years, died there Oct. 15, aged 61.

John Drake, one of the proprietors of the Sturgis Foundry, at Sturgis, Mich., committed suicide Nov. 5th. Family troubles said to be the cause.

Thomas Howard, president of the Shickle, Harrison & Howard Iron Company, St. Louis, died at his home in St. Louis Saturday morning, October 12. Mr. Howard had not been in good health for some time past, but had only been confined to the house for a little over two weeks. Mr. Howard was born in Lewes, Del., in January, 1831, and was consequently 64 years of age at his death. Mr. Howard arrived in St. Louis in the early part of 1860 and engaged himself with the Excelsior Iron Works. He, in connection with Frederick A. Shickle and L. D. Baker, bought out the Excelsior Iron Works and commenced business under the name of Thomas Howard & Co. Their principal business during the years of the war was making shot and shell for the government. In 1873 the firms of Thomas Howard & Co. and Shickle, Harrison & Co. consolidated, and in 1881 they were incorporated under the name of Shickle-Harrison & Howard Iron Company, with Mr. Howard as vice-president. In 1890 Mr. Howard was elected president of this concern and held that post until his death. Mr. Howard was also vice-president of the Howard-Harrison Iron Company, Bessemer, Ala., since their organization until January 1 of the present year, when failing health caused him to resign, and he at the same time disposed of his interest in that company. Mr. Howard has been identified with the iron manufacture in St. Louis for over a third of a century, and by his death the city loses a good citizen and his employes a charitable and liberal employer.

New Foundry Enterprises.

John W. White, Ed. Petefish, and other well known molders of Peoria, Ill., have leased the extensive foundry plant of Nicol, Burr & Co., in that place. It has been shut down for several years, but the new managers hope to keep it running steadily.

The new foundry for the Shickle-Harrison-Howard Co., at St. Louis, will cost $300,000.

The Ohio Cultivator Co.'s new foundry at Bellevue, O., is completed.

The Union Foundry Co. will erect a new building in Grand Rapids, Mich.

J. F. Friggers has established a new foundry at Seattle, Wash.

Skow Bros. are building a 32x70 addition to their foundry at Newton, Ia.

The Moore & White Co. are erecting a one story foundry, 60x60, in Philadelphia, Pa.

The Whitin Machine Works, Whitinsville, Mass., is building an addition 92x62 to its foundry.

Savill & Sullivan's new foundry at Canton, Ill., is running again, having been entirely rebuilt since their fire of Sept. 24.

Messrs. Cand & Hawksworth have erected and occupied a fine new foundry in Helena, Montana.

Among the Foundries.

The Novelty Manufactory & Foundry, of Alexandria, Ind., has gone into the hands of a receiver.

Strothman Bros.' foundry, the largest in Superior, Wis., has been placed in the hands of a receiver, owing to contentions among partners.

The P. H. & F. M. Roots Co., of Connersville, Ind., makers of pressure blowers, are adding a new foundry, 100x50, to their already extensive plant, and a cupola room, 50x25. This seems to indicate several things. In the first place, this well-known concern must manufacture a first-class article. It must be thoroughly appreciated, and they must be blessed with a high grade management to make such changes necessary.

Fire Fiend.

The Falls Rivet & Machine Co. had their entire foundry building destroyed by fire Oct. 26. Loss, $25,000.

The foundry of the American Well Works, Aurora, Ill., was destroyed by fire Oct. 21. They are rebuilding.

The Knapp & Pratt Mnfg. Co.'s foundry at Geneva, O., was burned Oct. 16. Loss, $25,000.

The Magee Furnace Foundry Co. at Chelsea, Mass., suffered from a $6,000 fire in their foundry Oct. 29th.

The Gillespie Foundry & Machine Shop at Chatham, N. B., was destroyed by fire Oct. 10th.

Pittsburg and Vicinity.

The general iron and steel market has shown few changes but it is evident it has lost no strength. Advances in prices are few, but the situation indicates a strengthening of values and that trade will settle down to a firm basis at remunerative prices.

In all lines production is keeping up and the output is large, but the demand seems sufficient to prevent any accumulation of stocks. The strong tendency in the pig iron market is caused largely by the fear that the ore supply will fall short this winter. The furnaces throughout this vicinity are holding their own and show little disposition to accept anything below present rates.

The placing of orders for cars and railway equipment during the past month has greatly helped to strengthen the market for certain forms of finished products. These orders have been desired for months and months and the demand will, no doubt, become heavier each month.

The following are the prices of the different grades of iron: Grey forge, $12.25 to $12.50, cash; all-ore mill, $14.00 to $14.25, cash; No. 1 foundry, $15.00 to $15.25, cash; No. 2 foundry, $14.00 to $14.25, cash; Bessemer, $16.25 to $16.50, cash; charcoal foundry No. 1, $17.50 to $18.00, cash; charcoal foundry No. 2, $17.00 to $17.25, cash; charcoal cold-blast, $24.00, cash.

Coke.—Shipments from the Connellsville region are very heavy and there are more ovens now in blast than ever before in the history of the region. The demand is even greater than the shipments and can hardly be supplied owing to the scarcity of cars. The production and shipments must be forced up to meet the demand. The H. C. Frick Coke Company has secured entire control of the McClure Coke Company's property, the interests having been purchased at a figure, said to be $1,000,000. This gives the Frick Coke Company almost entire control of this vast territory, estimated to be about 50,000 acres of coal. For years the

McClure Company has been recognized as the leading competitor of the Frick people, and now that it has passed into the hands of the largest concern in the region, speculation is rife as to future developments. The H. C. Frick Coke Company has also purchased the interest of the Fairchance Furnace Company. Prices are as follows: Furnace coke, $1.60; foundry coke, $2.00; crushed coke, all sizes, $2.25. All per ton of 2,000 pounds, f. o. b. cars at ovens.

Rolling Mill Castings.—There is still a good demand being experienced and prices are very firm:

	Cents per lb.
Chilled rolls, up to 12 in. diameter..	3¾
Do. over 12 in. diameter....	3¼
Sand and homogeneous steel rolls and pinions up to 12 in. diameter..	2¾
Over 12 in. diameter.....	2¼
V-tooth pinions, additional	¼
Housen and rolling mill castings not otherwise specified	2
Spindles and coupling boxes.....	1¾
Squeezer castings	2
Squeezer pinions and wheels.....	2¼
Spur and bevel wheels, large.....	2½
Spur and bevel wheels, small.....3 to 4	

Copper.—This metal is still in good demand and prices are ruling at 11¾ to 12 cents.

Pig Lead.—This metal is not in very heavy demand, while prices are barely steady at $3.55 to $3.60.

Pig Tin.—Considerable activity is reported in this market and prices are ruling strong at last report, the price being quoted at 16¼ to 16¾c.

The Wilbraham-Baker Blower Co., of Philadelphia, Pa., have placed the order for their new pattern storehouse with the Berlin Iron Bridge Co., of East Berlin, Conn. The building will be 64 feet wide and 86 feet long, one story high, with brick side walls, covered with the Berlin Iron Bridge Co.'s patent anti-condensation corrugated iron roof covering, and will be absolutely fireproof. This change has been rendered necessary by the great increase in their blower business.

Questions and Answers.

There has been much discussion among stove foundry men as to the cause of what is termed "rat-tails" on face castings. Some of our men are of the opinion it is caused by the iron mixture, others from sand, or facing, etc., etc. Would you be willing to insert the question in your next issue of THE FOUNDRY asking for opinions of foundry men who read your journal? I am sure such a subject would interest your readers as well as ourselves.

B. M. S.

E. E. E. wishes to know the right time and way to introduce phosphorus into brass crucible.

Replying to this question in a general way the Moro-Phillips Chemical Co., of Philadelphia, one of the best known manufacturers of phosphorus in the world, write as follows:

We understand, in a general way, that the phosphorus is introduced into the brass crucible and that as the brass melts the phosphorus also melts and becomes incorporated with the material. Phosphorus, as you know, will ignite when exposed to the air and we understand to overcome this in a measure, the phosphorus that is to be used in the mix is taken out of the water tank, wrapped up quickly with wet news-paper, which excludes the air long enough for the foundrymen to handle the phosphorus, and place it in the crucible. The percentage of phosphorus in the resulting metal is governed, of course, by the amount of phosphorus that is used in the melting. The foundrymen should make allowance for the loss of a small percentage of the phosphorus during the process of melting.

We wish we could give more definite information than the above, but the secret of using phosphorus in the foundries successfully is well guarded, and although we are the oldest manufacturers of phosphorus, we have been unable to get access to the phosphor metal foundries where the actual use of phosphorus is made.

During the year we accumulate a great many tons of cast borings and Bessemer steel and wrought iron turnings, which we have been disposing of at a comparatively low prices, we would like to utilize this material in our foundry and convert the same into the commoner kinds of castings. Can you give us any information as to the method employed in utilizing stock of the kind mentioned. We hardly think it would be advisable to melt it in our large cupola, as the heat is too great and the blast too servere.

W. J. C. desires some information concerning the melting of old car brasses in a cupola, how to charge, what and how much fuel to put in, whether there is a great percentage of waste, and how to daub ladles to carry the brass.

G. W. P. says he has been having considerable trouble in casting a shell on some cold rolled steel shafts for corn crushers, the difficulty being to get a solid casting. The cylinder is 11½ inches long, shaft 1¾ diameter, with ⅝ metal all around it. He says he has cast them on side and on end; set them in cold and hot, has coated them with coal oil and a core wash mde from plumbago and talc, but found that casting on end and using the core wash gave the best results. In writing on this subject E. H. Putnam says:

(1.) Brighten the shaft by turning or grinding, set it in the mold and pour at once, in order to give as little time for oxidation as possible (oxidation that may hardly be seen by the naked eye will repel molten iron).

(2.) Gate the mold in as many different places as possible in order to avoid fusing the steel shaft, which latter will invariably cause "blowing." (The fusion of steel or wrought iron in a mold by a stream of molten cast iron always produces a gas which, if it cannot escape, will cause a "blow hole.")

(3.) Use an iron that shrinks as little as possible. (Iron cast on a steel shaft does not shrink toward the common center of the two; but it shrinks toward the center of the cast iron measured from the shaft to the outside of the casting, provided, the diameter of the section be much greater in the cast iron than in the steel center. Or else, cast iron of excessive shrinkage also expands excessively after solidification and before the final cooling of the casting.)

I have poured many thousands of castings on steel centers, and always have best success with iron of least shrinkage.

Painting with red lead in oil will prevent blowing in wheels cast on wrought spokes, but whether it would answer in this case I do not know.

L. M. R. desires to know how to cast a brass sleeve on a steel shaft out of hard brass that will not crack. Also of what mixture the brass should be made.

A practical foundryman desires some additional information concerning the melting of steel in the cupola.

In your September issue a question is asked concerning the using up of old steel scrap. It seems to me that it would be an easy matter, and if I had it on my hands would melt both together in proportions of 25 per cent of steel to 75 of common cast iron of good quality, and a large number of hard castings often called for in the average foundry could be successfully cast.

These blocks can be melted in the average cupola, and if too large can perhaps be stored on end and the iron and fuel packed about them.

He can also melt his small steel, whether old scraps or castings, in the ladle if the iron is hot, by putting from 25 to 80 pounds in a good sized bowl ladle and tapping onto it.

This iron can be used in a great variety of ways and makes the best of brake shoes, locomotive cylinders and car wheels, or if a drop is required for breaking large work it can be made by this mixture much stronger than any other.

Elkhart, Ind. J. TODD.

In reply to the inquiry of E. D. N., who asked some questions concerning aluminum, Mr. F. J. Davis, of the Cowles Electric Smelting & Aluminum Co., of Lockport, N. Y., writes as follows:

"Aluminum should be melted in an ordinary graphite crucible in the same manner as brass or bronze. If no flux is used and the metal is not overheated there is no danger of taking up silicon or other impurities from the walls of the crucible. On account of its high specific and latent heat, aluminum requires a long time to melt, and unlike many other metals does not have to be heated far above its melting point to become fluid enough to pour. The cooler the metal is poured the less will be the shrinkage. The mold should not be faced with graphite or other facing, as it tends to discolor the surface of the casting.

Our company is making an alloy which is designed mainly as a casting metal for work where pure aluminum lacks strength and rigidity. It is very nearly as light as pure aluminum and about the same color, although its cast surface is whiter. It makes a sharp, clean casting, is considerably harder

and shrinks much less than pure aluminum.

It is rather difficult to answer the question of Mr. N. regarding the bending of aluminum as compared with brass, as it would depend entirely on the grade of brass used for comparison. Pure aluminum would bend considerably easier than ordinary brass, but the alloy mentioned above is about as tough and rigid as brass."

In answer to J. E. Green, I may state that state that cast iron will not boil when in a molten condition, therefore have no gaseous substance to create blow holes, hence we must look to the material it comes in contact with to find out the cause.

In answer to E. M. R., I also state: Coke is a proper material used to form a vent channel, and can safely state that no casting will decompose it to prevent the gas from escaping. You can bring this to a practical test by examining the coke after a large cast, and you will find the coke in the same condition as when placed there, but care should be taken not to have it too fine where a large volume of gas has to pass through it. For further instructions on this matter I refer you to the article in the February issue, page 192.

ROBERT WATSON.

In looking through your issue for September I see L. S. W. wants to know what to do with some old steel castings, and from the description these can't be very large. If he has a cupola why not use it, say to the amount of 10 per cent, with pig iron containing from 2.5 to 3 per cent silicon. With this mixture he will find that extra strong castings can be made for machinery or agricultural work. He would also like to know the cheapest way to dispose of small masses of iron from 10 to 18 inches square by 2½ feet long. Why not try an old style refining furnace such as was used in England and Wales, descriptions of which can be seen in any work treating of iron manufacture, or to drill from two to three holes, according to the size of the block, so he could rend them into small enough pieces with dynamite, which we have done often, exploding them with a battery. This is much quicker than a drop and breaks into much smaller pieces.

I. C. Green asks if it is possible for blow holes in castings to be caused by the quality of the pig iron from which they are made. I think yes. But before anyone can say that that is the cause of the blow holes a very close scrutiny needs to be made of all the details. Coke containing too much sulphur or melting the iron cold, either from poor wind or too little fuel, will cause the same trouble. A good molder can tell very quickly whether the fault lies with the iron, the melting or the molding.

E. M. R. asks: Is coke the proper material to use in venting large molds? I don't know of any better. It must be a very heavy casting that will cause the coke to decompose or get hot enough with the proper amount of sand around it to cause a casting to blow from the gas generated from it, especially if the vents are large enough and clean enough to let the gas escape easily as generated J. P.

On reading L. S. W.'s question, the first thing that suggested itself to me was, they had better sell the whole job lot to someone that has facilities for handling and disposing of such stuff, as it appears they have no such facilities. For such blocks as he describes, 10 to 18 inches square by 2½ feet long, there is no trouble getting rid of with a 4,000 pound drop at 25 feet fall into pieces small enough to readily melt in a 48 inch cupola, and the amount he has would not justify the building of a reverberating furnace, and even if he did he could not handle and remelt it for less than $3.00 per ton, and such pieces can be disposed of with the drop for far less money. The 50 tons of steel scrap, in my judgment, better be consigned to some steel foundry, who will pay more for them than can possibly be obtained from any process of reduction and running into sash weights or floor plates. I have never used dynamite for breaking scrap, but can refer you to Otto Smith, foreman of Colorado Iron Works Foundry, at Denver, where I know they used it quite extensively.

Second question. Blow holes in castings.

It is possible for blow holes to occur in castings by the quality of pig iron used, and the element that causes this is an overabundance of sulphur, as a rule, but I believe turpentine has more to do with creating blow holes, hence improper melting will certainly cause them to appear. Pouring and improper gating will also assist in making

blow holes where there is the best possible mold and cores to pour into. As a preventat- therefore, I would advise the use of good selected iron carefully melted with the best coke to a good white heat, care and discretion in gating ("top-pouring being the best where practiced"), pouring as hot as mold will stand it and as rapid as possible, being sure to keep gates flooded, standing by and touching up a little while iron is in the act of solidifying. Outside of this, you must be sure of well constructed mold and cores and all excess of moisture must be avoided and all parts of mold made so iron will lay kindly to it.

Third question. The venting of large molds.

In order to allow gas to escape free from the bottom surfaces of large castings it becomes necessary to have a porous bed of some kind, and coke is most commonly used for this purpose, for the reason that it is most convenient. The question is asked if there is heat enough from large castings to decompose the coke, thus causing a gas to rise that would fill the vents. Not if the coke bed is properly made, both as regards distance from castings and also that outlets are plenty large enough to carry generated gas to the atmosphere. W. F.

Notice.

Advertisements Entitled Situations Wanted, or Situations Vacant Will be inserted in this column one insertion FREE. All others 25 cents per line.

ATTENTION—We offer for sale our foundry and machine shop at Turner, Ill., together with the boiler, engine and shafting contained in the same. Turner is located on the Chicago Outer Belt Railway, which connects with all the railroads entering Chicago. Address for particulars, J. E. PORTER & CO., Ottawa, Ill.

FOR SALE—One iron column lathe, takes in 21 feet column; turns both ends same time; good order. Address E. F. RUSSELL, 1155 S. Paulina St., Chicago, Ill.

AN EXPERIENCED foundry cost clerk employed in one of the largest foundries in the United States (wishing to improve his position) is open to an engagement with a reliable firm. System simple, concise and modern, and applicable to all kinds of foundries. Satisfactory references furnished. Apply M., care Foundry.

FOR SALE—At a very great loss to close up an estate. In order to close up the estate of Mr. Huntington Beard, we offer for sale a first-class foundry and machine shop plant, consisting of a machine shop 30x60, three stories high, with a complete set of iron and wood-working tools and machinery; foundry 60x80 feet, with first-class equipment; fire-proof pattern building, 30x30 feet, three stories high, containing a very large stock of most desirable patterns; also blacksmith shop, storehouse, japanning building and office building; both steam and water power; located on the West Shore Railroad and Erie Canal, eight miles from Syracuse, N. Y. This is just the plant for manufacturing hardware specialties, and it can be bought for about one-quarter of its cost. For further information address The Estate of Huntington Beard, Fayetteville, N. Y.

The Plumbago Club.

Since our last report the Plumbago Club has held one or two sessions, but the time and place in each case was kept scrupulously secret. President Hilbs was largely responsible for this, but whether his actions were inspired by a superabundance of modesty or only in harmony with his well-known fondness for mysteriousness, we are not correctly informed.

Only one or two incidents of those sessions have reached us, and from what we can learn they were largely of an exceedingly social nature. Hence, perhaps it is as well that all the details should not be exposed to the vulger gaze.

Their last meeting occurred in the new rooms of the club in Cincinnati, which had been beautifully furnished during the summer recess, most of the furniture being cast iron and donated, this material being essential in view of the severe strain it might possibly be put to during any excitement which might arise at any time.

The names of those firms who had so kindly furnished samples of their ornamental iron work were:

The Standard Foundry & Manufacturing Co., Cleveland, O.; Economy Foundry Co.,

Syracuse, N. Y.; Western Foundry Co., Chicago; Washington Iron Works, Buffalo; Cahill Iron Works, Chattanooga.

President Hibbs called the meeting to order in person and delivered himself of an exceeding felicitous speech. He spoke first of the general prosperty of the foundry business and hoped all present were sharing in it. For himself, it was not necessary to say much. They all knew that he had the reputation of getting his share, and sometimes part of the other fellow's.

He believed in covering a limited amount of territory and doing it thoroughly; this idea of trying to sell every foundry in the country was foolishness and the concern who tried to do it, pay freight and sell first-class goods at a low price would have to misrepresent more or less.

He urged those present to especially speak kindly of their competitors in business. In an extended experience he had found that the man who did otherwise was destined always to fail.

To sell only the best goods at the lowest possible prices and treat our fellow dealers according to the precepts of the golden rule should be the ambition of every member of the Plumbago Club.

Secretary H. F. Frohman reported the receipt of two applications for membership—Wm. Russell, vice-president and manager of the Phoenix Iron Works Co., of Cleveland, Ohio, and L. S. Brown, president, vice-president, secretary-treasurer and general manager of the Springfield Facing Co., and moved that their applications be received, accepted and the applicants admitted to the sublime degree of membership in the club. As usual, there was confusion on the announcement of the new applicants for membership. President Hibbs rapped loudly for order and succeeded in quieting all present but S. T. Johnston, who only resumed his seat beside Mr. Vrooman with the aid of some gentle pressure from his friends and after the president seemed to be inclined to throw the gavel at him.

After order was restored the president recognized Mr. Baird, of the Joseph Dixon Pencil, Plumbago, Crucible, Foundry Facing Co., who endeavored to pour graphite on the agitated scene by expressing the hope that if these gentlemn were deserving they would be admitted to full membership without any friction. Friction, he said, was a bad thing, and while it could nearly always be removed by the Dixon Co.'s preparations, yet there were cases when the machinery got out of balance and overheated and some one was apt to get hurt, in spite of the best goods on the market, whether imported from Ceylon or mined at Ticonderoga. This seemed to be the trouble in the present case, and in his well-known oleagenous manner, he seconded Secretary Frohman's motion to admit both gentlemen to the enjoyment of all the privileges of the club.

Vice-President Smith amended this by moving that each proposition should be acted on separately. This was seconded by Mr. Vrooman, and the amendment being put first, was carried.

The secretary then read the application of Mr. Wm. Russell and was about to move that he be admitted when he was interrupted by Mr. Johnston. The latter said that he was glad that he was a member of the club for many reasons, but principally because it gave him the opportunity of keeping, or trying to keep Mr. Russell out, and said he felt that had Mr. Russell been admitted first the situation would have been exactly reversed. He charged Mr. Russell with claiming to make a crane superior to those made by the Whiting Co., something everybody knew to be an impossibility. Further, he knew of cases where Mr. Russell's prices had been even lower than those quoted for the genuine Whiting article, and finally, he had actually secured orders in competition with Whiting cranes simply because he made customers believe his statements. Mr. Johnston claimed, further, that the Whiting appliances were the only ones suitable for foundry use, and that they were entitled to a monopoly of the foundry equipment business on general principles. If Mr. Russell was admitted he would get on good terms with some of the members, and perhaps all of them, with the result that the Phoenix Co. might make some influential friends and the Whiting Co. be deprived of what they were justly entitled to. He conceded that Mr. Russell was personally very popular, but that was what he most feared, and as his ability as an entertainer was well known, he feared that the members might perhaps spoil him with their atten-

tions, etc. How much longer Mr. Johnston might have continued no one knew, but he was interrupted by Mr. Hill, a man of very few words and uncertain nationality, who said that Mr. Johnston had convinced him that Mr. Russell was just the man they needed. He was in favor of everyone getting their share of the business and opposed to this idea of one concern being the largest, best, oldest, etc. True merit alone should count, and if Mr. Russell was a jolly good fellow, he would always find every member of the club ready to follow him and accept any courtesies he might offer. In case any of the members fell by the wayside, they could easily call an ambulance.

Other members spoke in the same way until the parliamentarian of the club, Mr. Vrooman, raised the point of order that there was no regular motion, and made one himself that Mr. Russell be permitted to pierce the veil of mystery that shut out the world and be introduced into the inner circle. Carried unanimously, with the exception of Mr. Johnston's emphatic NO.

Mr. Hill suggested that if Mr. Russell had anything with him that he desired to donate for the use of the members of the club that he be permitted to bring it in. All, even Mr. Johnston, agreed to this. Mr. Bullock moved that Mr. Brown be admitted to membership and said that Mr. Brown was, in his opinion, the ideal foundry supply man.

Gentlemanly, courteous and honorable to an extent unfortunately not as common as it ought to be. If he had one fault it was his extreme sincerity and modesty, and as a competitor living in that vicinity, he could bear witness to the fact that he had never heard of his doing anything but the most straightforward kind of a business, and this club was being honored by receiving his application.

That they appreciated this was shown by the fact that the president said he felt sure all agreed with Mr. Bullock and were glad to hear him speak in that way, and as there were no objections, declared him unanimously elected. After Secretary Frohman had retired and collected the membership fee of $25.00, the newly-elected members were introduced by Doorkeeper Hill with a grand flourish and cordially welcomed, notwithstanding the sudden lowering of the temperature when Mr. Johnston assured Mr. Russell of his great delight in meeting him there.

After the president's brief address of welcome and the newly-elected members' acknowledgement of the same, the president inquired of the secretary if he had anything to bring before this session, and the latter read the following report:

To the President and Members of the Plumbago Club:

"The undersigned, having been appointed a committee of one to examine into the truth of certain charges made against the character of Mr. White, one of the most reputable gentlemen connected with the foundry supply business, wishes to report as follows:

That the letter read and purporting to be from one of the leading foundry firms of the United States situated in Springfield, Ohio, was a rank forgery, no such letter ever having been written by them. Further, that a careful inquiry among hundreds of that gentleman's acquaintances failed to reveal a single transaction of his that was open to criticism, as he had always been found to be unusually careful, and a more honorable man never lived.

In his private life he was known to be a pillar of the church and the living embodiment of all the cardinal virtues.

His fine sense of what was fit and proper was shown by handling only Radiant facings and refusing many offers to accept positions with other concerns, merely because of the inferior quality of their goods. The letter referred to was no doubt a piece of spite work by some competitor.

(Signed)J. D. SMITH,
Committee.

The report was accepted in silence, Mr. Griffith alone looked amused, and that perennial smile like sunlight dancing on the water flitted for a moment across his face.

Mr. Hill moved that the club tender a reception to its friends on Thanksgiving day, which was carried after some debate. A committee consisting of Messrs. Hill, Russell and Vrooman, was appointed to provide refreshments, with instructions to get plenty if they intended to be present themselves, and after the president had pronounced the benediction, Mr. Russell's invitation to try a new brand of mineral water was accepted and the meeting adjourned.

Another One.

The foundrymen of St. Paul and Minneapolis have formed an association for the purpose of rectifying, if possible, some of the evils that, as a class, they are compelled to labor under in that portion of the country. Those present at the initial meeting were: S. T. Ferguson, F. J. Lewellyn, O. P. Briggs, of the Twin City Iron Works; Mr. Lockwood, of the Union Iron Works; C. S. Bushnell, of the Northwestern Stove Works; Messrs. Smith and Ingram, of the Diamond Iron Works; Mr. Howells, the pump man; Mr. Simpson, of the Enterprise Machine Company, and Messrs Northway and Cole, of the Williford & Northway Manufacturing Company.

The officers elected were: F. J. Lewellyn, president; O. P. Briggs, vice-president; Ed. Lockwood, secretary-treasurer.

The Buffalo Iron Co. of Nashville, Tenn., is the title of the new company that has purchased the property of the Southern Iron Co. Mr. R. Ewing, who has been in charge heretofore as assignee, is president. Only one furnace will be operated at present, and its product will be Mannie charcoal softener. There was considerable doubt expressed by pig iron consumers when Rogers, Brown & Co. began to push the sale of Mannie some two years ago for use as a softener. Charcoal iron was associated with ideas of strength. The combination of silicon and phosphorus in Mannie with almost an entire absence of sulphur gives satisfactory results, and hundreds of buyers east and west claim to have made castings peculiarly clean and soft with it in their mixtures. It is graded by analysis of silicon and not by fracture.

Thanks.

The article commencing on page 125 of this issue is reproduced from the Iron Age of October 17 and is part of a series they have been publishing since March 28, entitled "The History of Iron," and which treats of this very interesting subject almost from the beginning of time.

The Berks Foundry of Reading, Pa., who are now in existence a little over a year, have purchased the entire stock of three foundries, the Riverside and the Union Jobbing, at sheriff's sale, and the Keystone, at bargain sale, and removed the goods to the Berks Foundry, at Tenth and Amity streets. They advise us that they are doing a prosperous business in the manufacture of small hardware and jobbing work.

A fly wheel, 104 inches in diameter and 20,500 pounds in weight, has been successfully cast at the Shihuahua Foundry, Chihuahua, Mexico, for the works of a local mining company.

A Wise Selection.

The Illinois Steel Works have been making many improvements at their various plants of late and evidently contemplate more. They have just engaged the services of Mr. A. Sorge, Jr., of Chicago, who makes a specialty of such matters, to make a complete inspection of their foundry plant at Joliet, both as regards equipment, capacity, possible improvements, daily practice, etc. He will make a report to the company in the near future that may be the basis of changes and improvements in that direction.

She Knew Him.

A story is traveling the rounds of southern Missouri which but too truly shows how many of us reveal our occupation and furnish the world with a trade mark for better identification. A couple of Hannibal's molders were invited by a friend to a country dance, and being strangers in the neighborhood, the rural girls were anxious to find out their standing in society. To the question, "Who are they?" no one ventured an answer until a little miss more observing than the rest, answered, "I know who they are, they are molders, I know for sure, because they have got sand in their ears."

I hereby renew my subscription to The Foundry as I appreciate it very much I find it both interesting and instructive.

EDWARD GRANT,
Beaumont's Foundry.
Kankakee, Ill.

Must be Good Times or Good Sand.

The molding sand business of the State of Ohio is assuming vast proportions. There are several well-known concerns there all doing business over a large area of country, and just now all are reported as being very busy. Concerning one of them the Cincinnati Enquirer of October 26 had in its columns the following:

Zanesville, Ohio, October 25.—E. M. Ayers, of this city, is one of the most extensive dealers in molders' sand in the country, the product being obtained in large quantities near this city. To-day the statement was made at his office that there never was in the history of the business the demand for molders' sand, and only yesterday they turned away an order for 30 car loads. The iron manufacturers are preparing for the winter trade, which promises to surpass anything in the iron line for years.

A Correction.

Mr. Editor—In your October issue you speak of my paper before the Milwaukee meeting of the Western Foundrymen's Association on "Example of Cost Sheets for Foundries." I think that your remarks are liable to give a somewhat erroneous impression as to the applicability of the system which I presented. The very title of the paper indicates that the forms and tables presented at the meeting are not to be accepted as applicable to all cases, but that the system, as developed logically, can be used uniformly by modifying the details for each particular case. The paper should be read in connection with the article which you printed in your September issue. The classification of the work done in a foundry is the vital and primary step necessary to a simple and thorough keeping of accurate costs. This classification is the point that will in all cases require close and careful study of the character of the product and the methods and equipment of each particular plant. Then, when this has been fixed, a logical consideration of each individual step in the work will show just what special blanks and forms are needed to make a perfect and simple system of keeping costs. The particular point which I wished to emphasize is the need of close analysis at the start, when the system of costs is first introduced, so as to avoid the setbacks which are sure to occur when a plan is used which is only half digested, as it were. The exact forms which I presented would not be applicable in any case that I know of in their exact shape, but the principles involved in the development of such forms as given would apply to every foundry in the world. When once started in the correct manner the system is as nearly automatic in its operation as such work can be which depends upon men to carry it out. I mean that special training is not required of the individual who posts up the items and makes out the report. An ordinary clerk of fair ability in the use of figures and accounts of simple character, can carry the work through without any difficulty. Therefore the accuracy of the costs will not be impaired by the absence of this clerk, because another can be put into his place without great loss of time in breaking him in to the system.

Thanking you for the kind words of your notice, I remain,

A. SORGE, JR.

Chicago, November 6, 1895.

Philadelphia Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on Wednesday evening, November 6, the president, Francis Schumann, presiding.

The Executive Cimmittee reported that trade was in a rather better condition than it was last month, although prices showed very little improvement. Freight rates on pig iron from the South and some Western points had been advanced, a fact which should tend to hold up prices. It was found, however, that the majority of foundries had not been successful in getting an advance in the price of castings. About 100 letters had been sent out to the different parts of the United States, from Maine to California, and while repl'es showed prices to be unchanged, a marked change for the better in the volume of business was reported, the majority of foundries being busy and some working at night. The outlook for new business appeared to be good, and the prospects for business during the winter months were bright. The railroads had made re-

cently some large contracts for new cars and rails, which would furnish employment for a large number of mechanics, and help many lines of trade.

In the letters sent out opinions were invited as to the best time to hold the proposed convention of foundrymen, and the consensus of opinion expressed was that May would be the month best suited to the trade at large. Many of the correspondents also expressed their intention of sending representatives to the convention.

The committee referred to the subject of strikes, and the trouble which foundries in the vicinity of Boston and New York were having, brought about by the unions. As far as the committee could determine there had been little or no trouble in the vicinity of Philadelphia. It was an open question whether the association could take any action in the matter, but the subject was ripe for discussion. The committee had formed one impression, and that was that a molder had a right to stipulate for certain wages, but if his demands were not satisfactory to the employer he had no right to prevent another molder from filling his place. In other words, it was quite plain that a proprietor of a foundry had a right to run his own works.

Election of officers for the ensuing year being next in order, Mr. Glover moved that Mr. Devlin cast a ballot electing the gentlemen nominated at the last meeting of the association. The motion being carried, Mr. Devlin cast the necessary ballot for their election. The following are the officers for the ensuing year:

President, Francis Schumann, of the Tacony Iron & Metal Company, Philadelphia.

Vice-President, P. D. Wanner, of the Reading Foundry Company, Limited, Reading, Pa.

Treasurer, Josiah Thompson, of J. Thompson & Co., Philadelphia.

Secretary, Howard Evans, of J. W. Paxon & Co., Philadelphia.

Executive Committee, Walter Wood, of R. D. Wood & Co., Philadelphia; Thomas Glover, of Glover Bros., Frankford, Philadelphia; E. E. Brown, of E. Brown & Co., Philadelphia; Stanley G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia, and William F. Sauter, of G. Rebman & Co., Philadelphia.

Howard Evans, for the Committee on Arrangements for the proposed convention of foundrymen, stated that owing to the limited time in which to prepare it had been found impossible to hold the convention at the time decided upon at the last meeting. The committee would probably have another meeting at an early date, when the time for holding the convention would be decided upon. As stated in the Executive Committee's report, May was the month generally favored for the meeting, and as the movement was well supported and a splendid programme drafted, and invitations to inspect the plants of some of the largest concerns in the country were in hand, it was not thought that the convention would prove other than a great success. President Schumann stated that another reason for postponing the convention to a later date was the fact that a meeting of the National Association of Manufacturers, in which many foundrymen were interested, would be held in Chicago at the time selected for the gathering of the foundrymen. The Atlanta Exposition also at that time would probably detract from the attendance of the trade in Philadelphia.

The following were elected to membership in the association: The Vaughan Machine Company, Peabody, Mass.; the Samuel L. Moore & Sons Company, Crescent Shipyard & Iron Works, Elizabeth, N. J.; C. R. Elliott & Co., Philadelphia.

President Schumann then expressed his thanks to the members of the association for the honor done him by re-electing him their president for the coming year, which was likely to be an important one in the history of the association. He pointed out the importance of a good attendance at the meetings, and hoped as many of the members as could possibly make it convenient to attend would not fail to do so.

It was expected that Dr. Hunter would be present to address the meeting in explanation of a new process for converting white iron castings into steel, and of a process for making cheap armor plate, but owing to sickness he was unable to be present. President Schumann said that in the absence of Dr. Hunter the meeting would take up strikes as a topic for discussion, and as M. F. Moore, Jr., of the Samuel L. Moore & Sons Company, Elizabeth, N. J., whose

molders were out on strike, was present, he would ask him to inform the meeting how the strike came about and who was to blame for it.

Mr. Moore in response said that his company were, for the first time in their history, suffering the experience of a strike. It was brought about entirely by the Molders' Union, and the first intimation the company had that the strike was in contemplation was a visit last spring from a delegate, a resident of Brooklyn, who represented himself to be a sub-delegate of the union. The company were then paying as a minimum in their shops $2.25, and they employed anywhere from 50 to 75 molders. The highest rate they paid was $3.25 or $3.50 to one or two men. The company at that time had contracts in hand so important that it was not deemed wise to resist the union.The demand affected only about eight men in their employ at that time, and the wages of these men were raised to $2.50 as a minimum. But in the meantime the men had taken possession of the shop, and their shop committee meet any new man at the gate and resist his entry. Within the last six or eight weeks the delegate again visited the works and demanded that the minimum rate should be $2.75. The company then took steps to resist the demand. After discussion the union came to the conclusion that the demand was perhaps too high, and that if the company would make the minimum $2.60 the men would be allowed to continue working in the shop. That was all right, but the company owned the shop and the men did not have a dollar invested in the business, and the owners decided to assert their rights. The consequence was that without any notice the men went out, leaving molds unfinished to the value of about $700. Weeks and months had been spent on some of the molds, and the only satisfaction to be had was the retention of the pay of the men engaged on that work. That was a new tack to the men, and they hunted the State of New Jersey in efforts to bring a criminal case against the company, but without success. They were at present intercepting every man coming to the works after employment, and the company were to-day in the position that they were obliged to discharge men from their machine shops because castings were not forthcoming. Could any one, he said, suggest any relief? Was the shop to be surrendered to these men? If the men were a class whose services could not be dispensed with, submission might be in order, but he thought the company should be permitted to manage the business as they pleased. The company were later visited by a man from San Francisco, who walked into the office with the dignity of a king and said that unless so and so were done the union would do so and so. Why should he dictate in that way to the company, or to any concern? They had to compete with other people. "We turn out," he said, "a general character of work, as greatly diversified as the work from any shop in the United States, and we do not use one-third of our product in our own shops. How far can a manufacturer go and still maintain his dignity? If the gentlemen here to-night will support us, believing us to be in the right, our shop will remain shut until 1897. We are in shape to resist, and with support the strike would soon be terminated. These delegates," he said, "have no hesitation in saying that this proceeding is only a commencement of a movement to make every shop in the United States pay this rate of wages. But shall we assist them in doing that by submitting to their dictation?" Continuing, he said the day before the strike commenced the company placed orders for a 30-ton electric crane and a cupola with a capacity of 25 tons an hour. This would give an idea of their business, but they would keep their shop shut for a year if they were satisfied they were right.

Mr. Riehle thought the time had come for owners of works and foundries to form an association, not revengefully, but in justice to themselves, and to let these leaders see that manufacturers could organize as well the men they employed. Such a stand, he said, would go a great way toward settling matters of this kind. He was of the opinion that Mr. Moore should have the support of the association. Mr. Moore, continuing, said that some of the men out on strike had been in the employ of the company upward of 20 years, and were not what might be termed first-class molders, but they filled satisfactorily positions in the works and had been satisfied with their wages. Now, he said, if we are told that we must pay $2.75,

we say in reply that we must have better men. The delegates were told that if more competent men were brought in substitution of the class mentioned they would be paid $2.75 or $3 if they could earn it. It was not a question of salary, but rather of what a man could produce. An annoying part of the strike was that a day was not set for rits commencement. The men left the works embarrassed, as they supposed. If they were to succeed in carrying their point at Elizabeth they would, no doubt, commence similar procedure in Philadelphia. If there was any support to be had from manufacturers his company would be glad to have it. He could recite a case of a strike in a foundry where the foundry was shut up nine months, and his company did $60,000 worth of its work, and did not have a union man in their shop.

Mr. Rankin believed that all foundrymen would have some experience of the movement before long, and that when the trouble came it would have to be met either singly or as a whole. Now the question to decide was whether it was best to fight 100 men alone or with 99 others to assist. He gave an instance of the good effected by combined resistance when trouble was experienced in the stove trade in 1886. In this crisis it was recognized that force had to be met with force, and the outcome was the Defense Association, which by a course which he explained broke up the trouble in five weeks, and no further trouble had been experienced.

Mr. Moore related an experience he once had at the time his concern were building a cruiser for the government. They frequently had trouble with their iron workers, and finally a man who claimed to represent the Iron Workers' Association called at the works, his mission being, as he put it, to "pour oil on troubled waters." This man was plainly told that when wanted he would be sent for. That was the last they heard of him until they were notified to appear before Secretary Tracy on a charge made by the delegate that they were doing inferior work. Although there were about 12 naval representatives at the works during the construction of the vessel the company were obliged to attend at Washington to make explanation. This incident would show what these agitators were capable of resorting to. It was impossible to foresee where this sort of thing would stop. Trouble was eminent, and if there was anything to be done as an organization let an organization be effected for the purpose.

Mr. Devlin said his firm had had a little experience with the union. There was once a strike at one of their plants and they closed the place. The men then threatened to force them to open it and run it. He was interviewed by Mr. Fox, the union delegate, and had said to that gentleman, "You do not pretend to say your organization is going to make us run these works at a loss?" Mr. Fox talked very nicely in reply, but to no effect, the works were kept closed. Finally a plan was adopted which had put an end to trouble from that time. The firm selected 15 of their best men and put them to work as stockholders, and they were still there, such as were living. Each man was given $1,000 worth of stock and allowed to pay for it in weekly installments, and the interest and profits set apart to assist him, with the idea that in about five years, if the business was successful, they would own the stock. They were paid the same wages as before, and there had been no reduction whatever. The firm had found this plan to work better than the course suggested by Mr. Fox. A laughable incident took place at another time, when the men were talking of striking for an advance. A committee of five men called at the office one morning about a grievance and after they had talked it over they went back to the shop. Four of them returned a little later and asked that the fifth member of the committee be discharged because he hadn't paid any dues. They were told that the firm could not enforce their end of the business. The man was not discharged, and that was the end of the matter.

Mr. Schumann said he had always recognized the right of a man to get what he could. If they could get $10 per day, well and good, their employers would have to get more castings. There seemed to be a tendency on the part of the meployes to organize. Probably they were taking pattern from the traction combines who were able to charge what they liked in the way of rates: but these combines, being wise, did not infringe upon the law. The workingmen, not being wise, did infringe. He con-

sidered that they committed a criminal act when they acted as they did at Elizabeth. He could employ men, if he wanted, at $1.25 per day, for plain work. Such men did not interfere with molders, as they could not do the latters' work. He would not allow an organization to command him as to how he should grade his men. All men were not born alike. Now, he said, if employes effect an organization, and it should prove complete, foundrymen must themselves organize. One thing he would caution against, however, would be the creating of any feeling of antagonism. We can recognize the right of the men to organize, but they must not overstep the mark. When they exceed their rights it is simply an aggression on the part of a body of men which must be met by a counter aggression. From what he had heard that evening it seemed that there was a tendency to strikes all over the country. Just imagine, said he, the condition of the trade to-day, and then a strike for more wages. His foundry, he said, was then running to keep the older men at work. It did not pay, and he knew that many present could detail the same circumstances as existing in their works. If the foundry business should revive to such an extent that foundries might be loaded with work beyond their capacity and compelled to seek molders, and proprietors were getting 10 cents for castings, they would gladly pay $5 per day for good men. "The point is this, if we are to meet an organized attempt to put up the wages to a fictitious basis, supply and demand will, of course, regulate them in the end; but in the meantime a whole district may be disorganized by an imperfect effort on the part of the men. If it was a united movement all over the country we could not deny the right of the men to demand $5 per day wages, and if we could not get a man for less than that, why we should have to pay it. Such a condition would be quite different from the condition of the case reported, where the methods pursued by the men are aggravating."

Mr. Flagg asked whether Mr. Moore was originally waited on by his molders.

Mr. Moore replied that not a man in the shop had opened his mouth on the subject from the time of the strike to the present. The delegate managed the whole business. There was not a man in the shop dissatisfied with his wages; in fact, some were getting more than ever before.

Mr. Schumann was of the opinion that if the Foundrymen's Association was of any weight in the country its members should prepare a "declaration of principles," in which was recognized the right of other men—whether molders or other employes. Let that recognition be the fundamental principle of the declaration. Then with a good committee to arbitrate, using the declaration as a basis for arbitration, they would have done something against the law. "We are evidently going through a change," he said, "and this is a proper procedure for an association like this."

Mr. Rankin thought the suggestion made by President Schumann a good one, and that the principle of "right" was the best policy to work on. If a piece of work was worth more than was being paid for it, it was no doubt right to pay more for it. If such a declaration was to go forth it should contain nothing but what was fair. A committee, under a thorough organization, could take up such cases as the one reported from Elizabeth and investigate them. If the result of the investigation proved the employer was not acting in the proper spirit, and was not willing to do what the committee thought best for himself, the association could advise him of the course it considered best for him to pursue, and if the advice was not accepted it would, of course, have to abandon him. If the course laid out by the association was followed, then the assistance and support needed could be accorded

Mr. Schumann suggested that a committee be formed to prepare a declaration, which should be absolutely fair as between man and man. This was the first time the subject had been broached at an open meeting, or any views openly expressed in regard to it. If an agitation was to come it was well to prepare for it. He had observed proceedings in founderies which men could not be blamed for resenting.

Secretary Evans explained that it was to deal with matters of this kind that an organization like the Foundrymen's Association was formed. These unions had been in existence for a good many years. Questions such as the one now before them had to be met sooner or later, and could be met

much better by an association than by an individual. In order to bring the matter to a working point he would move that a committee be appointed to look into the question and prepare the declaration suggested.

Mr. Schumann thought it would be better to refer the matter to the executive committee. It was not, he said, to be considered as an aggressive measure. The members of the association simply wanted to act fairly and be treated fairly.

After some further discussion the matter was referred to the executive committee to take action on the lines brought out in the discussion.

The meeting then adjourned.

James Chalmers.

The History of a Tramp Molder.

W. EDWARD.

CHAPTER XXII.

On leaving Niles I struck two weeks' work at the Aetna shop in Warren. They were not overly rushed, but I got on friendly terms with the foreman by having known a nephew of his and on the strength of this acquaintanceship he gave me a job. It only lasted a couple of weeks, and then I went up to Cleveland. It was about the 1st of February, and after I got a few whiffs of the fresh air from off the lake, in crossing the viaduct, I began to wish I was back in Texas, or some other place where the climate was more salubrious. Work was very fair in Cleveland and I had no trouble in striking jobs; the only troubleI experienced was in holding the jobs and getting living wages, but a man can't expect much from a place where they sell whiskey for five cents a drink, and give you two fried oysters or a hard-boiled egg with a glass of beer.

The first shop I struck for a job was the West Foundry Company, of which "Tommy" West was manager, and I was successful in getting work—for half a day. I had often heard of "Tommy" West, who was then the most prominent writer on foundry subjects in this country, and I had read one of his books, so I naturally supposed that any shop which he had anything to do with would be a model in every respect. I just want to describe that shop to show you how practice differs from theory, and that the man most fluent with pen and tongue does not always make the best manager.

There had been trouble in the shop before I went there, because they insisted on holding the blast back until 5 and 6 o'clock every evening to enable the men to get out what they required for a day's work, but, of course, as I was a stranger, I didn't know of it, or I would never have gone near the shop to look for work. When I started to go into the shop one of the shippers stopped me and said he was ordered not to allow anyone to go into the foundry. I told him I wanted to see the foreman, and he requested me to wait at the door while he went in search of him. I waited patiently at the door, but the foreman was not to be found and presently West came out to see what he could do for me. "Tommy" is just as slick with his tongue as he is with his pen, and he was all smiles and complaisance when I told him I was a molder and was looking for a job. The first question he asked was whether I belonged to the union, and in reply I showed him my card. Then he wanted to know how long I had been in the city and where I had worked last. On assuring him that this was my first visit to the city and his shop the first at which I had applied for a job, he said he was not sure whether they needed any more molders, but he would send the foreman out to see me.

After another long wait in the cold, and just as I was turning away, the foreman, a big Scotchman by the name of Henderson, who had, I learned afterward, left Brooklyn very suddenly with a large amount of money belonging to the union, came out to see me. He, too, asked me if I carried a card, and after studying the matter over for a few minutes he told me to come on in the morning. I asked him what wages they paid and he replied $2.50 for good men, so I hunted up a boarding house on Lake street and got ready to go to work.

When I went in to work in the morning Henderson showed me a floor on which there were four flasks which had been poured the night before, but had not been shaken out, and told me to cut over the heap and he would bring me a job. After shaking out the boxes and wetting down the sand I looked around for a shovel, but could find nothing but an old scrap shovel on the floor, so I went to the foreman and asked him

where I would find one. He said they were short of shovels, and stooping down he picked one up from the gangway and handed it to me. I looked at it, threw it down again and said, if that was the best he could do I had a better one on my floor and would use it. Then I looked around the shop to see what the other men were using, and I saw only about a dozen molders' shovels to among thirty-five or forty molders.

While I was cutting over my sand I saw the men gathering in groups of three and four all around the shop discussing something very earnestly. I could see that there was something wrong, and just as I started over to one of the groups to inquire what the trouble was, two men who had been standing with a crowd under the crane came down to my floor and asked me if I belonged to the union. I showed them my card and they appeared satisfied, but did not offer to take it. I asked what the excitement was about and they said the men were going to break up this thing of holding the blast back and keeping them there every night until 7 or 8 o'clock without getting anything for it. The crowd continued to gather under the crane and one of the men picked up a shovel and commenced to rattle on it with a gagger, when all the men quit work and crowded under the crane to see what was going on.

When I got up I saw West, Henderson and "Tommy" Lansdown, one of the partners in the concern, surrounded by a crowd of molders, all talking very excitedly about something, but what it was I couldn't make out. After a few minutes they arrived at some compromise; I believe it was a promise to put the blast on every day at 3 o'clock, and if it was necessary to keep any of the men after 6 o'clock they were to be paid overtime. This seemed to be satisfactory and we all went back to work.

When I finished cutting my sand over the foreman came and threw two patterns on my floor and said, "Here, I want eight of these for a day's work; four off each pattern." It was a machine for shelling corn, the top and bottom of cylinder shape with a square feed box at the end. The patterns were wood, about three-eighths of an inch thick, and one-half was full of green sand cores, which had to be watched carefully. I looked at the job and asked, "What if I don't make eight?" "Well," he replied, "you'll have to get out of the shop. I won't have a man in the shop who can't make eight of these a day," and he walked away. I had doubts of my ability to make eight in the shape which the patterns were in, and the fact that there was only four flasks on the floor made me think that some one had been fired the day before for failing to put up the stint. I asked several of the molders around me how many of these corn shellers were considered a day's work, but none of them seemed inclined to give me any satisfaction, and I went to work to do the best I could with them.

The firts thing I wanted was a brush, and after a hunt of ten minutes I found one and it appeared to be the only one in the shop. I consumed ten or fifteen longer looking for a riddle before I was ready to begin work. When I shook out the four flasks on my floor I threw the gaggers to the back of the heap, but when I came to use them there was not a gagger in sight; someone had come along while I was hunting for tools and cleaned up the pile. There is nothing more exasperating to a man than to start in a new shop with no tools to work with, and have the other molders "hogg" on you by carrying off everything on your floor. I asked my partner if he had seen who carried off my gaggers and he pointed out the man who had taken them. I walked over to the floor where he had just finished setting the gaggers in a big cope, and as he saw me coming he walked off to hunt a riddle. I suppose he thought he had the gaggers safe because they were set in his cope, but I had been around too much to let a little thing like that stop me from taking what belonged to me, so I proceeded to pick out as many as I thought he had taken from me and carried them back to my floor. When he came back he wanted to fight me. I told him it was hardly worth while fighting over a few gaggers, but if he wanted to fight anybody to go and fight the "boss." After looking over the shop for tools to work with I found that the complete equipment of tools for forty molders was about as follows: One dozen molders' shovels, the rest used anything they could lay their hands on, from a scoop shovel to a coke fork; two No. 2 riddles, a No. 4 and a No. 6, which was

also used by the coremakers for riddling flour; one clay-wash bucket and a brush with something more than a dozen hairs on it to clay-wash the bars, and only one soft brush in the shop. If there were any hammers, rapping bars or wood screws in the shop I was not there long enough to find them. The molders had to lift for each other and do a lot of work that in other shops would have been done by helpers, and yet a bigger day's work was expected of them than in any other shop in the city.

I worked away until noon as fast as I could, and when the whistle blew I had the fourth flask ready to lift off. After dinner, when I had my flask nearly ready to close, the foreman came up and commenced to talk to the man on the next floor to me about the trouble in the shop. I was stooping over my work with my back to him, but I could hear plainly what was said. Henderson told the other fellow that there were too many men in the shop and he had concluded that the only way to avoid trouble was to let some of them go. He intended to lay off a number of men, naming them, and he would fire the new man, meaning me, that night. I jumped to my feet, wheeled around and said, "I'll be —— if you fire the new man to-night; you go and get him his money, as he's going to quit right now." He refused to pay me unless I finished the day's work and poured off I didn't waste any words with him, but put on my coat, put my tools in my pocket, picked up a rammer, and asked if he intended to get my money for me. I guess he thought I was going for him with the rammer, as he asked what I intended to do with it and began to back away from the floor. I told him the four flasks of work belonged to me until they were paid for, and if he didn't go and get the money due me I would knock them out and have no further talk about it. He saw that I meant business, so he went to the office and came back in a few minutes with a dollar, which he offered to me. I refused to take it, telling him I wanted twenty-five cents an hour and I had worked six hours. He kicked on this, but finding that I insisted on knocking the four flasks out unless I was paid for them he went up to the office and got me the other half dollar.

That night the blast was held back again and the next day, I think it was, the men went out on a strike which lasted several months.

The next place I struck was the Excelsior, down on Columbus street. While roaming around the city I run across a man whom I had met in Niles. He was a machinist and said he was very well acquainted with the superintendent at the Excelsior, to whom he would introduce me if I was looking for a job. So I went with him and was introduced. I supposed he would let me talk for myself, but as soon as he introduced me he informed the superintendent that I was a molder and asked if there was any show for a job. "Why, certainly," said he; "just come into the foundry," turning to me, "and I'll introduce you to our foreman." I followed him into the foundry, and he introduced me to the foreman, telling him to clean up a floor for me, as I would start to noon. The foreman sized me up without saying a word, but I knew from his actions that he was not very well pleased at the superintendent's manner of doing business, and if I did go to work there he would find some pretext to get rid of me, or make it so disagreeable that I would be glad to quit. I told my friend of this when I went out; but he only laughed and said there was no danger but that I would hold my own with him, and even if he did fire me I wouldn't be any worse off than I was before. There was some philosophy in this, so I concluded to go to work and explain the matter to the foreman at the first opportunity.

I showed up on Monday morning, and the foreman gave me a piece about fourteen feet long to bed in the floor, warning me that it must be straight and perfectly clean, as it was to be planed on one side. It was a plain, ordinary job, and I went to work on it without any misgivings about being able to turn it out all right. The foreman said nothing to me, bue every time I raised my head I could see that he was watching me to see if I made any breaks. About ten minutes before 12 I asked the man next to me if they expected more than that for a day's work, and if I was any behind. He replied that the piece was considered a day's work and advised me not to lift the cope until after dinner. I knew I had done a fair morning's work and I felt easy when he said this, so I was not a little surprised when the foreman came over as soon as the

whistle blew for noon and said, "I guess we won't need you any longer; you can go up to the office and get your money." I didn't say a word; there was nothing I could say but to take my medicine like a man and get out.

I went up to my boarding house and changed my clothes, because a man always stands a better show looking for work if he dresses well and looks independent, and started out again on the hunt for a job. I went first to Bowler's, just above the Excelsior, and tackled "Bohemian" Henry, as he was called, for a job. He wanted to know where I had worked last and what class of work I had been accustomed to. Carefully avoiding any allusion to my two experiences in the city, I told him I had just left the Aetna shop in Warren, because I knew it had a reputation for good work, although for the greater part of the two weeks I was there I had made nothing but mill spindles and boxes, and said I preferred a job on heavy engine work if I could get it. I asked what wages were paid in the shop, and he said that he paid all the way from $1.75 up to $3.50 a day, and the variety of work was so great that it didn't make any difference what kind of a molder came along he could find a job that would suit him and give him wages accordingly.

There were nearly a hundred men in the shop of all nationalities, but the majority were Hungarians, and I found that there were lots of them getting less than $2 a day, while not more than a dozen got above $2.50. After skirmishing around the shop for a while Henry finally told me to come on in the morning and he would find a floor for me.

He had intended to start me on a crane floor in place of a man who had been off sick for a few days, but the man came out that morning and Henry put me on a side floor and gave me some rail braces to make. When the time came to pour off I sat on the edge of a flask and watched the Hungarians fighting over the ladles like a lot of hungry dogs fighting over a bone. I didn't feel like fighting for iron after working hard all day, so I sat smoking my pipe and watching the fun until I saw a ladle laid to one side with no one to fight over it. By the time I had poured off it was after 6 o'clock, and, as I was using iron flasks, I went home without shaking out. The next night it was the same thing, but as I had plenty of time through the day to put up my floor and could pour off without heating myself, I preferred not to shake out at night, as the thermometer was away below zero.

This was all right so long as I was on common work, but in a few days I got a better class of work in which I had to use good iron; then I found that I would either have to fight for my turn with the rest or quit. The first night I managed to get a ladle without much trouble, but the next night I made a scramble for a ladle and was knocked over a pile of flasks by a Hungarian who was big enough to eat me. This pretty near sickened me of the shop and that night I told Henry I was going to quit.

Some Thats.

The poet Tennyson could take a worthless sheet of paper and by writing on it make it worth $65,000—that's genius.

Vanderbilt can write a few words on a sheet of paper and make it worth $5,000,000—that's capital.

The United States can take an ounce and a quarter of gold and stamp upon it an "eagle bird" and make it worth twenty dollars—that's money.

The mechanic can take a material worth $5 and make it into a watch worth $100—that's skill.

The merchant can take an article worth 75 cents and sell it for $1—that's business.

A lady can purchase a very comfortable bonnet for $3.75, but she prefers one that costs $27—that's foolishness.

A ditch digger works ten hours a day and shovels three or four tons of earth for $2—that's labor.—Exchange.

Let me say a word in praise of THE FOUNDRY. It has been of much service to be. I get a great many ideas from it which are of value to me. The Foxboro Foundry & Machine Co. that I am with has run continuously with the exception of a very few years for one hundred and twenty-five years.

THOMAS TIERNEY,
Foreman.

Foundry Illumination.

The question as to how to most economically and efficiently light the average foundry is a problem that receives considerable attention about this time of the year. There are conditions that serve to make this matter a somewhat complicated one, such as the prevalence frequently of smoke, steam and dust, and the consequent necessity of selecting a light that will be as free from objectionable features as possible.

The arc electric light has been introduced very generally in large shops, and in some cases gives thorough satisfaction, but in the great majority of instances, especially where owing to the kind of work, height or structure of shop, much steam or gas is evolved while pouring or where portability is desired in handling the electric light fails to give entire satisfaction.

Of late years, however, there has been introduced and thoroughly tested a form of light that burns vaporized oil, in some cases using the ordinary crude oil and in others what is commonly called kerosene.

Those engaged in the manufacture claim for them so many points of superiority over all other known systems that THE FOUNDRY is led to believe that for many purposes, and foundry illumination especially, their more general adoption is restricted solely by a lack of information on the subject.

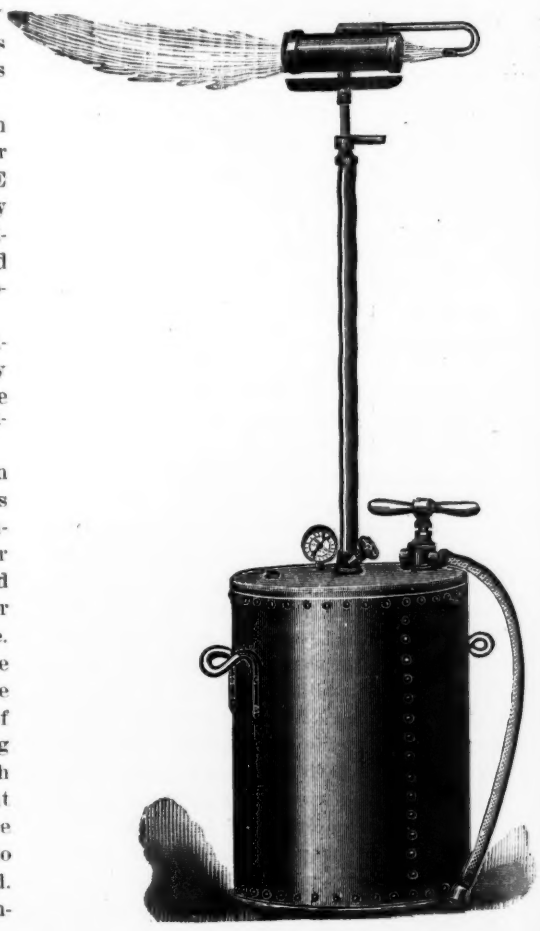
In the form of light shown in our illustration, and which is known as the "Sherry Torch," the inventor has sought to combine efficiency, simplicity and economy to a maximum degree.

The kind of oil used is kerosene, and an oil that will stand 150 degrees fire test is preferable . The tank in which it is contained is (in the case of a 2,000 candle power light) 18x24 inches, and will hold when filled about 22 gallons, but should never have over 15 gallons, the balance left for air space. As will be noticed from the illustration, the tank is equipped with a small pump, the handle for operating it appearing on top of tank. This pump is used for pumping either the oil into tank or filling it with compressed air. The pressure required at starting to secrue the best results should be 25 pounds, the pressure gauge serving to show at all times the exact amount carried. This will be sufficient for four hours' constant burning, and at the end of that time it will be reduced to about 12 or 15 pounds, when it should again be restored to the former pressure of 25 pounds, this latter operation taking less than one minute.

It is generally understood that the so-called 2,000 candle power arc light does not furnish more than an average of 1,100 candle power and seldom does it exceed 1,000.

In the case of a 2,000 candle power torch of the class we have been describing a flame 30 inches in length and 5 inches in diameter and of great illuminating power is given, with the consumption of only one gallon per hour, the light in this case being of greater volume and less intensity than with the arc light, thereby making but little shadow and not blinding or dazzling the eyes.

Being self-contained it can readily be moved from place to place or set near any



special piece of work, such as a deep mold, etc., or it an be set upon a platform at any height, and being near the floor its effect is not weakened, as would be the case were it higher up among smoke or steam. This is a great advantage where cranes are in constant use, as an electric light has to be hung high enough to clear such obstructions, and cases are not wanting where foundry employes have met their death by the current from a live wire getting tangled up with the crane machinery. Altogether where an effective and easily regulated light is desired at a small original outlay it would seem that this type is destined to become very popular as it becomes better known.

Have Opened an Eastern Office.

The Clinton Iron & Steel Co., of Pittsburg, have opened offices for the sale of Hector Foundry Iron at 15 Cortlandt street, New York, and have placed Mr. Edward C. Saunier in charge. Some extraordinary strong claims are made on behalf of this iron by its makers, who have adopted a thorough system of testing it in order that they may know exactly what it contains and what it will do.

They seem to be right in line with the most advanced thought on the subject when they assert positively that two irons may analyze identically the same and yet work entirely different. Hence something else besides chemical analysis is necessary, and they claim to submit their Hector to a physical and practical test that enables them to speak intelligently of its merits. Softness and strength are said to be its chief characteristics.

The Employer and His Foreman.

By JOHN RAMP.

The relation existing between the average foundry foreman and his employer is not in the majority of cases what it should be by any means, in order that the best interests of both should be properly served. The foreman, as a general thing, is not in the confidence of those in the office and is frequently but a figurehead in the works.

There is too great an anxiety to sacrifice quality for quantity, to value a foreman by his ability to drive those under him. When one of the latter is employed to run a foundry he often commences by measuring the size of each man's work, discharging some and scolding others, with the result that while apparently increasing the productive capacity of the shop he antagonizes the employees. The Foundry Proprietor comes into the shop occasionally, sees that the molders are apparently making more molds than before, and if he does not see it his attention is sure to be drawn to the fact by his new foreman, and he goes away thinking that at last they have their foundry at last under the best management. After a time—and not a long time, either—he commences to receive letters from customers who tell him that unless better castings are furnished they will go elsewhere. An investigation is made and it is found that the size of the scrap pile is larger than formerly, his molders are discontented and the amount of good work turned out is much less than formerly. He comes to the conclusion that his driver and pusher is not a success, discharges him and hires another as near like him as possible, with the same result. Again, in many establishments we have a superintendent engaged because of his knowledge of the draughting room, pattern shop or machine shop. I have upon several occasions been associated with men occupying such positions, and with one solitary exception I have never known one who possessed the necessary knowledge of the foundry business to fill such a position satisfactorily. Frequently they display a very lamentable amount of ignorance concerning practical foundry matters, and desire to have experiments made and new ideas tried that result in failures.

As a natural consequence, sooner or later an important casting may be lost. The Proprietor inquires of the Superintendent as to the cause. He blames the foreman. The proprietor thinks that a new foreman is needed on the spot and engages another man. Would it not be better and help to correct many of the evils constantly arising in all large establishments if the Proprietor or President of the company were to engage a first-class mechanic to take charge, make him feel his responsibility and let him make his own plans for successfully getting out the work?

Let him be taken into the confidence of his employers and keep him posted concerning the orders on the books and the kind of

work wanted, or likely to be wanted. It may aid him often in making his arrangements. Nothing ought to pay better than to have as often as possible a good confidential chat with him; it will encourage him as well as narrow the distance between the office and shop.

When harmony reigns and good men are in charge the best results can be counted on to a certainty and the Proprietor can always feel certain that his shop can do as well as any of his competitors.

We all Know Him.

The Age of Steel, in a recent issue, had something to say of a remarkably successful southern foundry, part of which we reprint because of its reference to Mr. Robert E. Masters, so well known to many American foundrymen. It says:

"It gives us pleasure to report a foundry concern that has run to a continuous successful business during the continued depression that has existed in business and stagnation in manufacturing interests during 1893 and 1894.

The Marshall Car Wheel and Foundry Company, Marshall, Tex., during these two years have not made any reduction in their force and have run full ten hours per day, without closing down one day on account of scarcity of work. Their output for 1893 from their foundries alone, without taking into consideration their output from the machine shop, was 14,000,000 pounds of cast iron product, and during [illegible] the product from their foundries was, in round figures, 17,000,000 pounds of castings, including 20,000 chilled cast iron car wheels of the various kinds used on standard railroads in this figure.

This company manufactures and makes a specialty of railroad work, such as car and locomotive castings and locomotive and car wheels, but they also do a large business in iron house fronts, logging cars, and jobbing work, repairing saw mill machinery, stationary and locomotive engines, etc. They manufacture the well-known "Hoo-Hoo" logging car so extensively used in the yellow pine and cypress regions of Louisiana, Arkansas and Texas. During the stringent times of the past two years a business of this kind speaks volumes for the prosperity, advancement and continued growth of the South, and shows what can be done under able and energetic management.

The management of this compony's business is in the hands of Robert E. Masters, well known to the railroad and foundry interests of this country. Eight years ago when Mr. Masters went South to take the management of this company's affairs, this journal said, "Men with his push and enterprise were needed in the South to help develop its industries, and his labors in that field would bring forth good results."

At the time of making this prediction this company's affairs were in the hands of a receiver and not in the most enviable condition, as a consequence of former management. But the plant was there, and the territory to be worked, and Mr. Masters has proved himself fully equal to the occasion, and the company has a strong financial rating. He was not satisfied to confine himself to the local business, as had previously been done, but at such times as he had the opportunity, and occasion required, he struck out after business, having personal interviews with railroad officials and soliciting their trade, covering a territory as far north as Cheyenne and Omaha, east to Cincinnati and Mobile, south to the City of Mexico, and west to Albuquerque and Salt Lake, and today independent of all other classes of work manufactured by this company, their car wheels are now in service on the Union Pacific, Denver & South Park, Denver, Texas & Fort Worth, Fort Worth & Rio Grande, Texas & Pacific, International & Great Northern, Cotton Belt Route, Mexican National, Mexican International, Monterey & Mexican Gulf, Pecos Valley, Louisiana & Northwestern, New Orleans & Grand Isle, New Orleans & Northeastern, Alabama & Vicksburg, Arkansas Pass, Vicksburg, Shreveport & Pacific, Queen & Crescent Route, and a number of smaller railroads.

During the building up of this business Mr. Masters, who is a thoroughly practical foundry man, and up to date in all the details of foundry practice, operation of cupolas, mixing and melting of iron, has been his own superintendent, dictating the policy of the business, making all the purchases of the material used, besides looking after all the contracts, and most important work on the road. He has a large circle of railroad friends who will be glad to hear of his success, and any one at all familiar with the

foundry business will appreciate what a diversity of talent is required to fill all of the positions successfully and the magnitude of the work in carrying it out.

Mr. Masters feels justly proud that whether North or South, during the most troublesome times, he has had several hundred men under his supervision, peace and good will has always existed between him and his men, and he has never yet been waited on by a grievance committee.

Iron Founding during the Sixteenth Century.

The art of casting metals had attained to a very high degree of perfection among the ancients. No doubt many efforts were made to cast iron like bronze. Their mechanical appliances, however, were too crude and primitive to produce the high heat necessary to make the iron fluid, and their methods of melting iron ores resulted only in wrought iron. When the application of water power made the production of pig iron possible, the first products of the iron founder's art were anvil blocks, stamp irons and cannon balls.

Fig. 2.—Front Plate of a Stove Cast in 1548.

Fig. 3.—French Andiron, Cast 1500

With further progress it was learned how to make gray iron, and better and smaller castings could be made. The art of war was changed as a consequence. Cast iron guns and other war material made their appearance. Cast iron stove plates, often with rich and artistic decorations, became a favored product of the founder's art. Very

Fig. 4—Portable Cast Stove, Sixteenth Century.

elaborate and detailed descriptions and instructions are extant about the manner and method of molding and casting and core making of guns, pots and a variety of war material and household utensils.

Quite a number of old stove castings are still extant, their manufacture reaching back to the fifteenth century. At first the box stoves were used only to heat large public halls, and on that account an artistic finish was soon thought desirable. A good example of the older type is that furnished by the stove in the hall of the walled castle of Koburg, Germany, which is described by Puttrich. It is considered to be of Nuremberg origin and it is probable that the patterns were made there, although the casting was presumably done at the furnace in Thuringia. It is probable that it was cast in the second half of the fifteenth century. Fig. 1 illustrates this stove, which is still in place at Koburg castle.

Another example of old stove castings, made by an artist famous in his day, is that of the castle at Spangenberg, Germany. The narrow front plate is reproduced in Fig. 2. The inscriptions show that it was cast in 1548, from patterns made by Philipp Soldan, by Kurt Scharpe, at the works of the Ilaina monastery under the management of Peter von Rolshausen.

In those countries, notably in France, where open fires were in general use, a good deal of attention was paid to andirons, many of them being cast. Fig. 3 illustrates an example from the private collection of M. de Bonys, which is attributed to the year 1500. A peculiar and pretty complicated

Fig. 1—Stove at Koburg Castle, Cast During Second Half of Fifteenth Century.

casting is illustrated by Gay, Fig. 4. It is a portable stove of the sixteenth century.

For war purposes, however, the iron founder and master found his best and most appreciative customer. The new artillery consumed immense quantities of iron and called for a high degree of skill. Emperor Maximilian I. of Germany was the first to have a solid wrought iron cannon bored out, instead of being forged over a mandrel. In 1590 the city of Strassburg possessed of artillery the following pieces, named respectively:

1. Metzikana (Big Gun) weighs 10,000 pounds, ball 110 pounds.
2. Cana (Basilisque), weighs 7,500 pounds, ball 75 pounds.
3. Duplicana (Nightingale), weighs 5,000 pounds, ball 50 pounds.
4. Triplicana (Singer), weighs 5,000 pounds, ball 50 pounds.
5. Quartana (Quartergun), weighs 2,500 pounds, ball 25 pounds.
6. Trakhana (Dragon), shoots a ball of 16 pounds.
7. Schlangkana (Snake), shoots a ball of 8 pounds.
8. Valkant (Falcon), shoots a lead ball of 2 pounds
9. Falkhona (Half Snake), shoots an iron or lead ball of 4 pounds.

Of these there were 55 pieces, 37 field guns and 18 siege guns, or wall breakers, as they were called. In addition there were "mortars" weighing 5,000 pounds each, "half mortars" weighing 2,500 pounds and "small mortars" weighing 1,500 pounds.

Biringuccias, in his renowned work "Pyrotechnica," gives a detailed account of the manufacture of cast iron guns.

The boring machines for boring the guns were driven by water power and a series of cog wheels. Altogether the machinery of heavy casting reached a high degree of perfection during the sixteenth century.

Peter Baude, a Frenchman, cast the first iron guns in 1547. Queen Elizabeth of England promoted the iron and gun industry in every way, and guns became an article of export so that Spain bought and used English made guns to fight England with. Sir Walter Raleigh called the attention of Parliament to this state of affairs and exclaimed: "Surely, formerly one of our vessels was superior to ten Spanish ones, but now on account of their using our guns we are hardly a match for them in single combat." The Great Armada carried 2,431 cast iron guns.

Industrial Notes.

The Wm. Harbaugh estate has been given permission to erect a three-story brick foundry and warehouse on Water street, this city, to cost $10,000.

The Homestead Manufacturing Company will erect a plant at Homestead which will consist of a machine shop, pattern rooms, blacksmith shop and foundry. It will soon be ready for occupancy.

Jones & Laughlins, of this city, have just completed the erection of an addition to their foundry, which is 40x80 feet. The polishing department is also being enlarged by the erection of an iron-clad building, 60x125 feet in size.

The Lewis Foundry and Machine Company, of this city, has just shipped two sheet mills to the Midland Steel Company, of Muncie, Ind., and one to the Reeves Iron Company, of Canal Dover, O. The company is building a very heavy rod mill for the Illinois Steel Company.

M. and S. H. Darragh, of Fallston, near Beaver, Pa., have a cupola in their foundry, made of stone, brick lined and bound outside with iron bands, which is over 100 years old and is still in constant use. When the foundry was erected the blast was furnished by water power.

At a meeting of the stockholders of the Frank-Kneeland Machine Company, of this place, rolling mill machinery and roll manufacturers, held recently, a resolution was passed empowering the officers to extend the machine shop building a distance of 160 x100 feet. This, with the additional equipment of machinery, will about treble its present capacity. An addition of 50x100 feet has just been added to the foundry, and a third air furnace will be added.

The Youngstown (O.) Foundry Company recently organized by Messrs. Miler and McCurdy, has purchased the iron foundry interests of the Morrison Foundry and Machine Works, and has secured orders for four new housings and a 12-inch shear for the Union Iron and Steel Company, of that place, also a large amount of work for other concerns.

Improved Double Rip and Cross Cut Saw.

The progress made in the manufacture of wood-working machinery within recent years is, in a great measure, due to the efforts of the Egan Co., 417 to 437 West Front street, Cincinnati, O., who have recently introduced the machine shown in the accompanying cut.

This machine for ripping, edging and cross-cutting is designed for general use, and is especially adapted for pattern makers and for others requiring accurate work.

The column is a single casting with the saw mandrels arranged to revolve around a common center, inside the column, so that when the ripping saw is above the table, the cutting-off saw is below, and vice-versa; while for grooving either saw can be brought above the table according to the depth to be cut.

The table of iron is made in two sections, both planed perfectly true; with the one on the left made to move back and forth on rollers for edging and cross-cutting. These are two miter fences, for cutting right and left, and one ripping fence, all accurately fitted to the table and in line with the saw.

The mandrels, of best quality of steel, running in self-oiling boxes lined with genuine Babbett metal, are driven from a countershaft placed clear of the column; a decided improvement over all other machines.

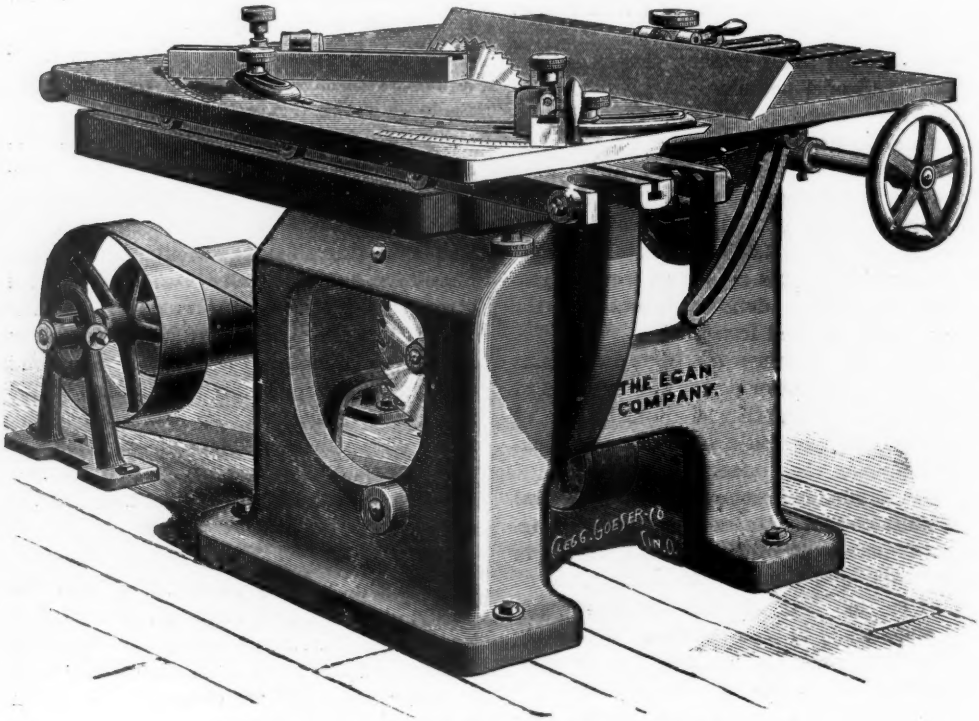
To those requiring a machine of this kind we can heartily recommend this one, and for further information of it we would refer you to the makers.

Enclosed please find one dollar for one year's subscription. Have enjoyed reading your magazine very much and should not think of getting along without it while I remain in the foundry business.

HIRAM A. WHITNEY,
Foreman Springfield Iron Foundry,
Springfield, Vt.

Enclosed please find draft for $1.00 to renew subscription. I would not like to be without a single number.

GEO. GREASBY,
Proprietor Novelty Iron Works.
Oskaloosa, Iowa.



Improved Double Rip and Cross Cut Saw.

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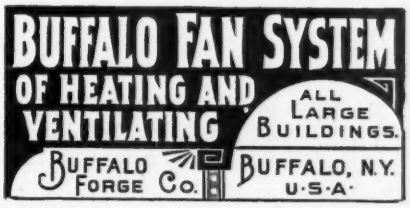
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BUFFALO
VENTILATING FANS
ELECTRIC, STEAM
AND PULLEY TYPES,
GREATEST AIR VOLUME,
LEAST POWER
BUFFALO FORGE CO.
BUFFALO, N.Y. U.S.A.

BUFFALO
SHAVING
EXHAUSTERS.
FOR
HANDLING
REFUSE IN ALL WOOD
WORKING INDUSTRIES
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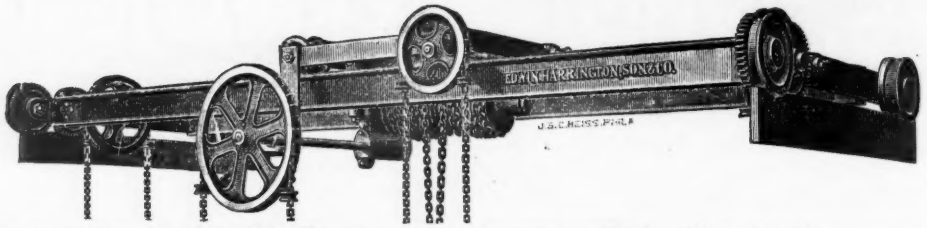
SAFETY TRAVELING CRANE.



Especially well adapted for Foundry use or wherever careful handling of loads is required. Thus copes and moulds can be lifted and transported with absolute safety. There is no jumping of chains; no jarring of load; no loss of sand; no breaking down of mould.

Will Hold the Load at any Point.

The chains wind on a drum, having right and left spiral threads. The hand chain wheel is removed from the line of the load by means of extended shaft a fact which is of great advantage to the operator. The crane is supplied with roller bearings and travels with an easy steady movement. It is equally well adapted for heavy or light loads.

Let us give you an estimate. State required span and capacity.

LATHES, DRILLS, PLANERS, GEAR CUTTING,
DOUBLE CHAIN SCREW HOISTS.

Edwin Harrington, Son & Co.

INCORPORATED.

1521 Pennsylvania Ave. - PHILADELPHIA, PA

FOR SALE!

At a Bargain.

Having closed our Foundry, the following appliances are for sale at a low price.

1 Cupola, shell 46 in, diameter. 40 feet high.
1 Sturtevant Blower, No. 4, with counter shaft and pipe.
1 Tumbling Barrel, 6 feet x 22 inches.
1 " " 5 " 22 "
1 " " 2½ " 12 "
1 Ladle with shank, 1,500 pounds.
1 " " " 800 "
3 " " " 250 "
1 Foundry Crane capacity 5000 pounds.
1 Yale & Towne latest Improved Traveler, capacity 10,000 pounds.

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Don't be FOOLED and think High Silicon Irons are a "cure all." Remember a "silk purse is not made out of a sow's ear."

The Best Material Only,
Complete Analysis and
Careful Testing . . .

In the Largest Chemical and Physical Laboratory devoted to Foundry Iron in the United . . States is what makes . .

CLINTON INSPECTED FOUNDRY IRON

THE IRON IT IS

Clinton Iron & Steel Co.

PITTSBURG, PA., U. S. A.

15 Cortlandt St. - - NEW YORK.

"Columbus" Steel Tubular Wheelbarrow.

Made throughout of the best quality of high grade steel. Tray stamped without joint, seam or rivet, with edge bound over steel rod. Handles, Legs and Wheels the strongest put upon Tubular Barrows.

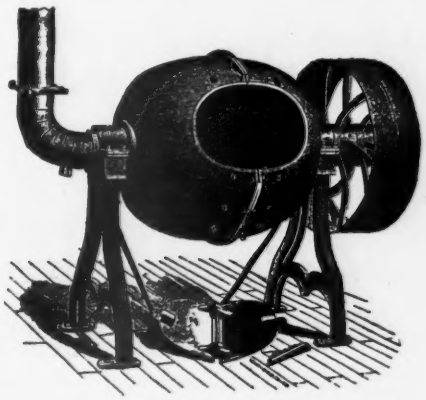
Made in nine different sizes. Largest manufacturers in the United States of TUBULAR BARROWS, STEEL CHARGING BARROWS and WOODEN BARROWS of every variety. Write for catalogue to

The Kilbourne & Jacobs Manufacturing Co.

LINCOLN STREET, COLUMBUS, OHIO.

STOVER'S IMPROVED

EXHAUST TUMBLING BARREL



The Stover Egg Shaped Barrel does double the work of any other with less noise and power. It gives the contents a double motion or action—from ends to center and from side to center—causing a thorough mixing and rubbing together of all the parts contained therein, cleaning and polishing the contents better and quicker than any other form of barrel.

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Stover Manufacturing Co.

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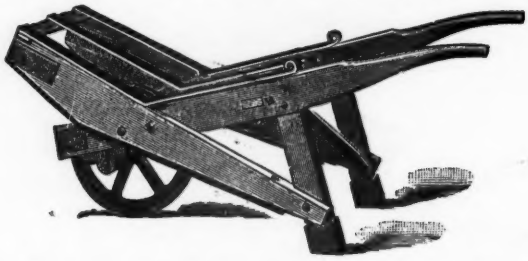
Pittsburgh Open Hearth Barrow



Weight 160 lbs. The heaviest and strongest barrow made. Ironed with half inch iron. Cast iron shoes bolted on legs. The only barrow that will stand carrying pig iron or billets. It will be noticed by referring to dimensions below that the barrow, though so very heavy, is very compact, so the load is easily managed. Furnished with 40 lb. Cast Iron Wheel. Can only be used by strong men.

DIMENSIONS.

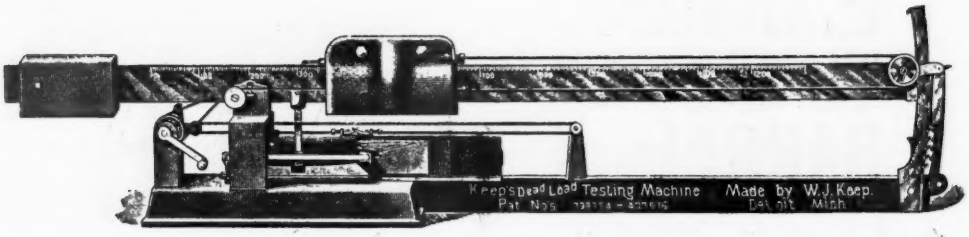
Handle 54 inches long. Length of Iron work on top, 34 inches.
Telegraph name, Scurvy.

WRITE FOR PRICES.

We make a large line of Steel and Wood Barrows and Warehouse Trucks.

LANSING WHEELBARROW CO., LANSING, MICH.

"Keep's Test" Apparatus.



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You can Produce
The Best Quality
Of Cast Iron from
The Cheapest Pig Iron.

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2 Sets Bronze Patterns with Followboard.
1 Pair Yokes for Shrinkage and Chill.
4 Iron Flasks.
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For Circulars and Price List, Address

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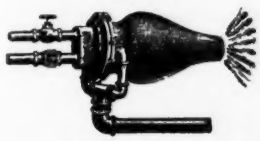

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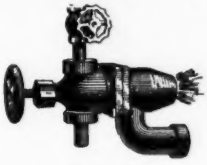

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DESIGNERS, CONTRACTORS AND ENGINEERS for COMPLETE FUEL OIL EQUIPMENT.

Plans, Specifications and Machinery for Complete Power Plants and Machinery Specialties. The only Perfect Crude Oil Burners on the market. **Acknowledged the best.**

It is economical, reliable, requires no expert to manage, cheaper than coal. For boilers, furnaces, forges, ovens, dryers, brick kilns, potteries, etc. No soot, no sparks, no smoke.

SPECIALTY FUEL ECONOMY.

We make a specialty of Fitting Foundries Complete with Fuel Oil Equipment for Crucibles and Core Ovens.

We can bake your cores quicker and cheaper with our system than with coal. Write us.

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CUPOLA BLOCKS,
FIRE SAND,
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FIRE MORTAR,
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AND ALL FIRE MATERIAL REQUIRED FOR FOUNDRY PURPOSES.

Send for Illustrated Catalogue and Prices.

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CHARCOAL

FOR FIRES.

CAR LOTS DELIVERED TO ALL PARTS OF THE U.S.

OUR CHARCOAL FACING FOR

BRASS FOUNDRIES

IS UNLIKE ANY OTHER.

IT WILL PAY YOU TO KNOW ABOUT IT.

SPRINGFIELD FACING CO.

SPRINGFIELD, MASS.

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THE FOUNDRY

The only foundry paper published in the world, and an authority on all matters pertaining to the foundry business.

RATES OF SUBSCRIPTION.

Single subscription to all parts of the United States and Canada, $1 per annum.
" " Universal Postal Union, 1.50 "
Eight or more subscriptions at one time, 75 cents each.

ADVERTISING RATES.

One page - -	per month, $20.00
Half page - - -	" 12.00
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When space is specified an extra charge of five per cent. on the above figures will be made. All pages between front cover and reading matter reserved for whole page advertisements.

Advertisers in THE FOUNDRY have the privilege of discontinuing their advertisements at any time after they have had three insertions, and will only be charged pro rata for the number of insertions printed. They also have the privilege of changing advertisements as often as desired.

The publishers of THE FOUNDRY appreciate the fact that it is customary for publications, especially the class known as Trade Journals, to quote a rate for advertising from which greater or less discounts are given, according to the persistency of the advertiser. This system is manifestly unfair as tending to show partiality. We have deducted the usual discount before quoting rates, thus giving it to all alike, and no reduction of any sort on the above rates can be made.

Copy for advertisements should be in by the 25th of the month preceding publication.

Brown & Sharpe Mfg. Co.,

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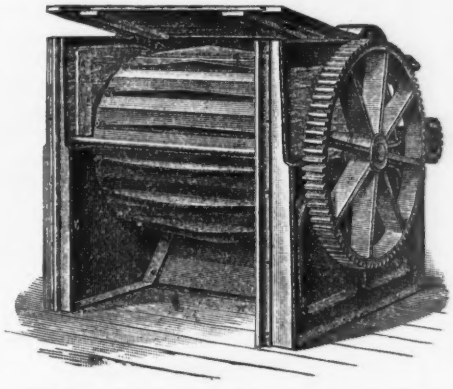
DIAMETER.

No. 1—23½ inch
No. 2—31½ inch
No. 3—31½ inch



LENGTH.

No. 1—26 inch
No. 2—31½ inch
No. 3—52 inch

PROVIDENCE, R. I.

DO YOU MAKE YOURS?

? ? ? ? ? ?

HENRY HANSEN

In his paper read before the September meeting of the Western Foundrymen's Association said: "The ordinary chaplets for which almost every foundry used to rely on the blacksmith nearest at hand, which has probably been the cause of more castings being discarded and patched up than any other thing of their size are now being made by special methods and presented in a far superior condition, besides being placed on the market at a price that would not keep a blacksmith in tobacco, at the same time there are many foundries that still insist on making their own inferior Chaplets."

JOHN PETTIGREW

Superintendent of the Illinois Steel Company's foundry, at Joliet, Ills. said at the same meeting on this subject: "It is only about six months ago that I first bought factory made chaplets. We were making our own chaplets and lost a great many castings from their not being properly made. After we had bought the first lot for, I think, 60 cents a hundred, I commenced to figure up the list of those we had made and found it had been at least $2.50 and besides were not as good an article."

WE KEEP ALL KINDS IN STOCK.

Cleveland Chaplet & Mfg. Co.

CLEVELAND, OHIO.

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Cowles Electric Smelting & Aluminum Co., Lockport, N. Y.

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Buffalo Forge Co., Buffalo. N. Y.
Connersville Blower Co., Connersville, Ind.
Garden City Fan Co. Chicago, Ills.
Root, P. H. & F. M. Company, Connersville, Ind.
Sturtevant Company, The B. F., Boston, Mass
Wilbraham Baker Blower Co., Philadelphia, Pa.

BRONZES.
Cowles Electric Smelting and Aluminum Co., Lockport, N. Y.

CAMERAS.
Eastman Kodak Co., Rochester, N. Y.

COKE.
Washington Coal and Coke Co., 7 Wood St., Pittsburg, Pa.

CORE COMPOUNDS.
Stewart, W. H., 182 Front St., New York.

CORE OVENS.
Millett Core Oven Co., Brightwood, Mass.

CORE OVEN CARS.
Lansing Wheelbarrow Co., Lansing, Mich.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Foundry Outfitting Co., Detroit Mich.

CRANES.
Craig Ridgeway & Sans, Coatesville, Pa.
Harrington, E., Sons & Co., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Shaw Electric Crane Co.
Wm. Sellers Co.
Whiting Foundry Equipment Co., Harvey, Ill.

CRUCIBLES.
Joseph Dixon Crucible Co., Jersey City, N.J.
McCullough-Dalzell Co, Pittsburg, Pa.
Taylor Crucible Co., Robt. J., Philadelphia, Pa.

CUPOLAS.
Foundry Outfitting Co., The, Detroit, Mich.
Whiting Foundry Equipment Co., Harvey, Ill.

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Brooklyn Fire Brick Works, Brooklyn, N. Y.
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Obermayer Company, The S., Cincinnati, Ohio
Ohio Sand and Clay Company, Columbus, Ohio
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Whitehead Bros. Co. New York.

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Sherry Torch Co., Rochester, N. Y.

FOUNDRY LADLES.
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Obermayer Company, The S., Cincinnati, Ohio.
Paxson & Co., J. W., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Smith Foundry Supply Company, The J. D., Cincinnati, Ohio.
Whitehead Bros. Co. New York.
Whiting Foundry Equipment Co., Harvey, Ills.

FOUNDRY PLANS.
Foundry Outfitting Co., The, Detroit, Mich.
Whitting Foundry Equipment Co., Harvey, Ills.

FOUNDRY SUPPLIES.
Foundry Outfitting Co., The, Detroit, Mich.
Joseph Dixon Crucible Co. Jersey City, N J.
Garden City Sand Co., Chicago, Ill.
Obermayer Company, The S., Cincinnati, Ohio
Paxson & Co., J. W., Philadelphia, Pa.
Smith & Co., J. D., Cincinnati, O.
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The best book for foundrymen published. It is issued in handsome cloth binding, and gives much valuable matter on how to reduce cost of mixtures, and on grading and numbering of pig-iron.

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And BRASS CASTINGS of Every Description, Heavy or Light. Let us figure on your wants.

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BRIGHTWOOD,
MASS.

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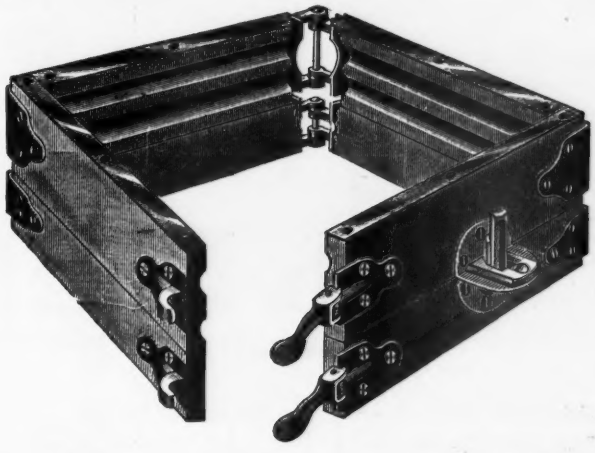

WE offer this special Flask at special prices. It is made of 1¼ inch Norway Pine and is the most perfect Flask on the market. We will send sample (any size) on receipt of $2.00. Sent C. O. D. Get our prices and discounts on large orders.

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WOOD WORKING MACHINERY

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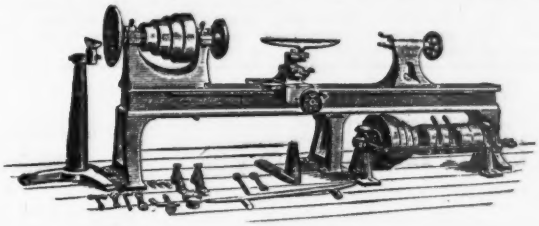

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Will stop a hole steam tight or Repair a defect in Castings and often save 100 times its cost in time and money in repairing defects in Cast Iron Patterns or other Castings . . . . . .

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PATENTED NOV. 14TH, 1893.

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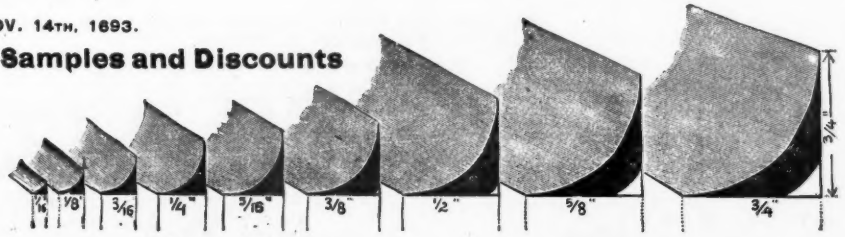

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Lightning Lifting Screw
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BY USING **FRASER'S PATENT RAPPING PLATES AND LIFTING SCREWS.**

Pattern Letters and Figures, Flask Clamps and Fittings, Leather Fillet Cutters, Universal Trimmers, Dowel Pins, Etc.

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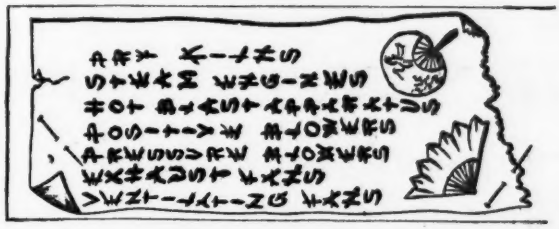

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of Confucius doubtless advertised this way—send for our new catalogue "G" and see how we do it.

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PATTERNS FOR CASTINGS.
ANYTHING, from a Toy Pistol to a Steel Plant.
Largest Pattern Works in the World.
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LIQUID Founders' Core Compound

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Prepared ready for use in **LIQUID FORM** to be mixed with the regular core sand. The cores are **DAMP-PROOF** and do not absorb moisture. **SPUTTERING** and **BLOWING** by reason of damp cores are avoided. The cores are **HARDER, FIRMER** and **STRONGER** than can be made by any other process and cost less to make. They can be set at any time and **EASILY CLEANED FROM THE CASTING.** Send for our descriptive pamphlet with prices and directions for use.

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Pegs 1 inch diameter.

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Plate Brass Dowels. Peg and Cup Brass Dowels.

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Metallic Letters and Figures.
Metallic Fillet,
Steel Shrink Rules.

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A COMPLETE ILLUSTRATED EXPOSITION OF

The Art of Casting in Iron.

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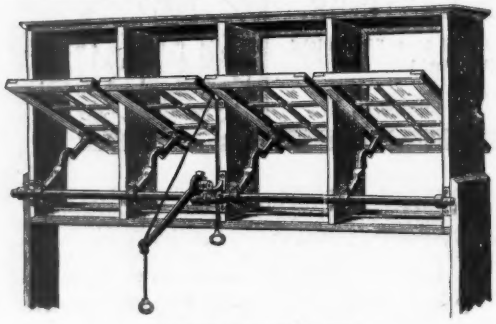

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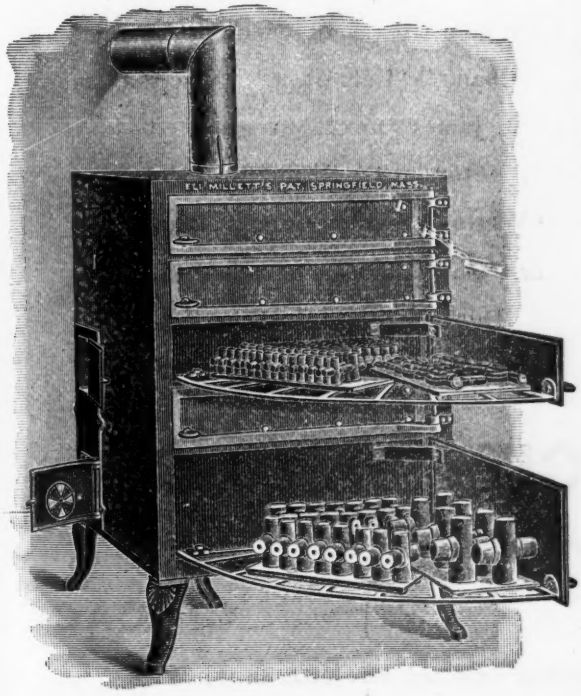

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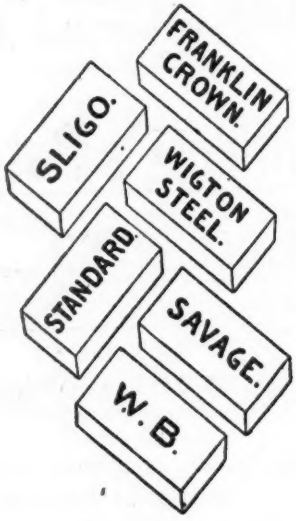

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